

# SUPPLEMENT.

## The Mining Journal, RAILWAY AND COMMERCIAL GAZETTE.

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No. 2435.—Vol. LII.

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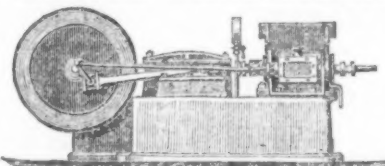
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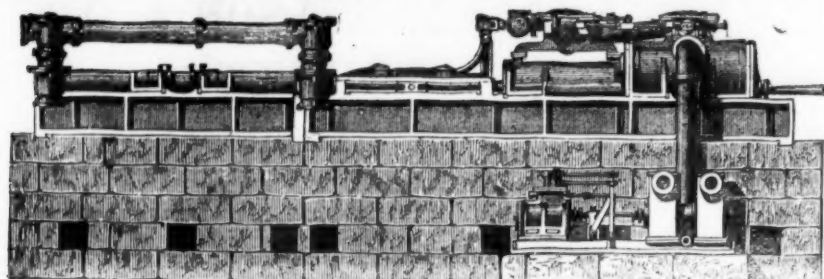
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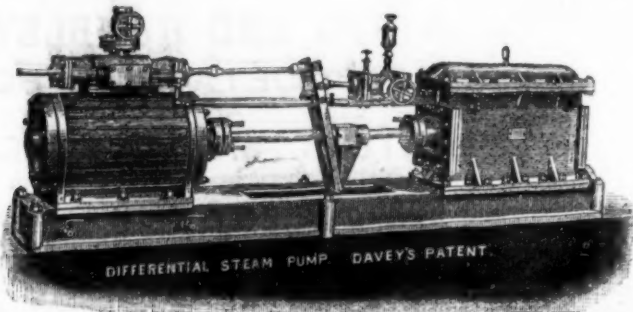
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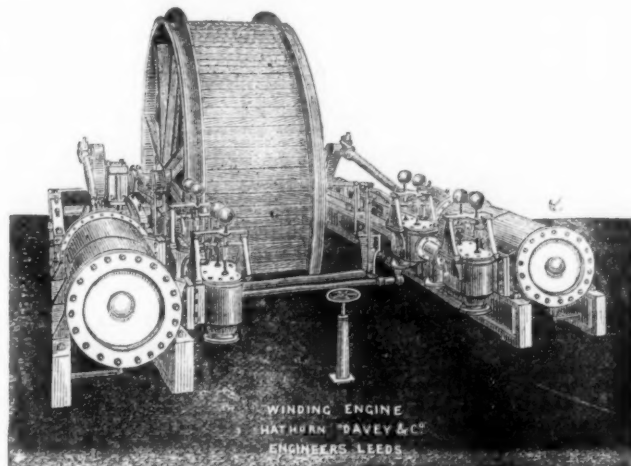
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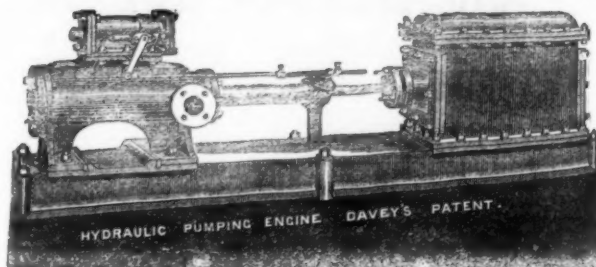
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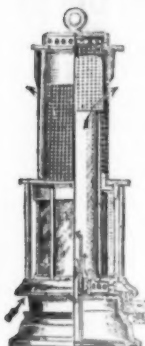
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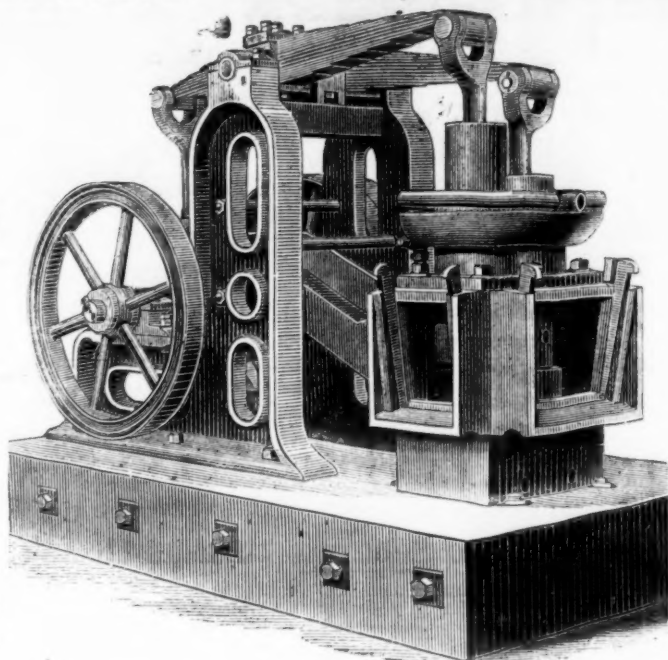
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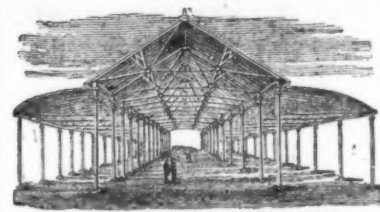
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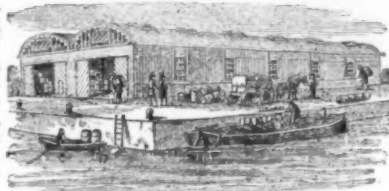
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The competing machines were the "Barrow," the "Cornish," and the "Eclipse"—each was fixed on the same mounting bar, and bored into the same stone. The result of the boring were as follows:—

Name of Machine.	Diameter of cylinder.	Diameter of Drill.	Time boring.	Depth bored.	Cubic inches of ground cut.	Cubic inches cut per minute.	Mean pressure per square inch.	Remarks.
	In.	In.	Min. Sec.	In.			Lbs.	
Cornish.....	3½	2	1 15	4½	14.1	—	—	
".....	—	1½	55	9	21.6	—	—	
Total.....	3½	—	2 10	13½	35.7	16.4	61	
Eclipse.....	3½	2	40	—	—	—	—	} Ran into Cornish hole; hole not properly watered.
" second try.....	—	—	2 0	1	3.1	—	—	
" third try.....	3½	2	2 35	11½	35.3	13.6	60	
Barrow.....	4	1½	15	¾	1.2	—	—	Gland to mounting bar broke.
".....	—	—	2 0	8½	19.18	—	—	
Total.....	4	1½	2 15	8½	21.0	9.3	60	

To R. H. Williams, Esq., C.E., President of the Mining Institute of Cornwall.

JAMES HOSKING, M.E.

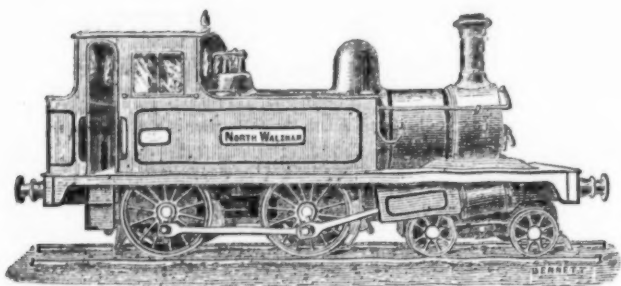
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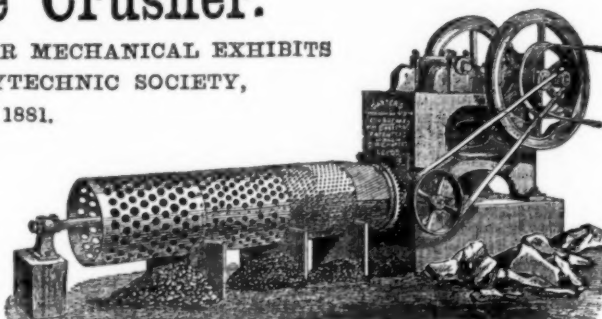
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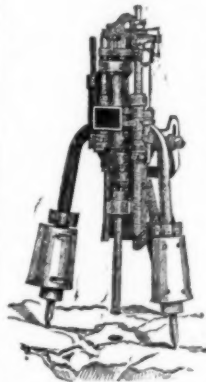
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By T. A. READWIN, F.G.S., M.M.S., &c.

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## Original Correspondence.

## THE GOLD AND DIAMOND FIELDS OF SOUTH AFRICA.

SIR.—Affairs throughout South Africa present a more serious aspect than they have done for several years. Last week I had occasion to go over our northern border, close to the place where the Boers and Korannas are attacking Mankorane. As near as I could ascertain there were about 700 Boers and about 1000 Korannas entrenched about eight miles from Taung, the principal town of Mankorane. The Boers have already stolen about 2500 head of cattle from Mankorane, besides nearly all his goats and sheep. Poor old Mankorane still labours under the fatal delusion that he will receive English help; but every person in that part of the country believes the Boers will carry out their threat of exterminating his tribe. The cruelties perpetrated by some Boers on unarmed blacks are of the most revolting character, and as they threaten to serve all the English they meet with in the same way their camp is not likely to be visited by many correspondents. In the Marico district of the Transvaal affairs are no better. Volunteers are offered 10s. per day, to be paid out of stolen cattle. On the 13th inst. it was discovered that 25 Boers who had been trying to do a little on their own account were missing. General Joubert has started a large commando under Captain Ferreira, to scour the country, and it makes me shudder to think of the manner in which he is likely to perform his task.

Whilst we in Kimberley are surrounded by hostile forces we are utterly unprotected; and, while every Boer in South Africa is armed with a modern rifle and a few hundred rounds of ammunition there is not 1 per cent. of the English people who have arms of any kind. Every Boer wagon that comes into this market daily is supplied with arms and ammunition, and if the Government do not take some steps for the protection of these diamond fields I am afraid that an armed impi of Boers and Kaffirs will be tempted to take possession of and sack the place. These are no pessimist views—it is a threat the Boers have indulged in ever since they thrashed the English soldiers in Natal. The result of this state of affairs is that the most legitimate undertakings are completely paralysed, and every part of South Africa is suffering in consequence. It seems like mockery to read in the home papers statements from responsible persons as to the affairs of the Transvaal, &c., which are as misleading to the English people as they are damaging to the true interests of South Africa.

I regret to say that mining throughout the diamond fields is very dull indeed; this is owing to a combination of circumstances, not the least of which is the border troubles amongst the Boers and Kaffirs. From Jagersfontein the accounts are of a very unsatisfactory character. The want of dividends in many cases is attributed to bad management; but, whatever may be the cause, there are no dividends, and the North-East Company has collapsed. The news from Koffyfontein is encouraging, and although many Kimberley holders disparage this property I believe it to contain the elements of success. Efforts are being made to puff up Oifantsfontein; but, whatever it may be, up to the present there are no indications of a payable mine. At Kamsfersdam they are still short of water for washing. I saw a small parcel of diamonds from there on Saturday, which were of very good quality, and speaks well for the future. At Otto's Kopje the diamond soil they are getting at present looks well. I am anxious to see how it turns out in washing. At Bultfontein the private company—Broadie Wells and Barker—is doing fairly well; but most of the other companies are going to the bad. At De Beers dividends are conspicuous by their absence; but this is owing not so much to the quality of the formation as to the way in which the concern is managed. Great hopes are entertained here that this mine is to be reloaded in Europe as one company. At Du Toits Pan there has been very little change during the past week. The Griqualand West Company has started more powerful machinery. I am surprised this company does not pay better dividends. The claims were only put into companies at about one-third of those of the Anglo-African, and there is nothing to choose between the quality of the ground in both companies; but the Messrs. Marks have a great deal to do with the management of the latter company, which makes all the difference. The Ne Plus Ultra Company is likely to pay a small dividend in April.

In my letter of Oct. 12, I pointed out that it would require an expenditure of 800,000l. to place the whole of the Kimberley Mine on a fair marketable basis. Of course, there are some companies from their natural position which are not so seriously affected by the reef as others; but all are more or less affected by the falling reef, and some companies representing a very large amount of capital have not seen their claims since they were put into companies, and they are not likely to see them for a very long time. When I wrote on Jan. 5 there were a very large number of claims which had been cleared of reef, and if they had remained so there is no question but that several of the companies would have paid very large dividends instead of working at a loss. I regret to say the reef is becoming more treacherous day by day, and it will continue to do so until some scheme is adopted for sloping down the sides of the mine from the surface to the igneous rock at a uniform angle of 45°. About five weeks ago I pointed out that the fall of reef in the north-east corner of the Kimberley Mine was merely the prelude to one of the largest falls of reef ever seen in the mine, and this is now taking place, much sooner than I anticipated. The whole of the east end of the mine—about one and a-half millions of tons—is on the move. This will seriously affect some of the best companies, and reduce the amount of their dividends for the first two quarters of the year. The Mining Board appears to be utterly incapable of overcoming the difficulties with which they have to contend in the Kimberley Mine.

But I am quite certain that a scheme can be introduced to relieve every company in the Kimberley diamond formation in twelve months, and relieve the mine completely of reef in two years. The Compagnie Française is putting up a really good engine; large for this place, but not larger than the smallest company in the mine ought to have. The Central Company, now that they have such a large number of rich claims clear, do not appear to be doing so well in proportion as they were before. The British and Barnato Companies (which ought to be one) are working with an amount of energy which is creditable to their managers. I wish I could say as much for some of the other companies. I had hoped ere this to have seen the commencement of operations in the St. Augustine's diamond formation; but, on enquiry, I find that Captain Finlason is getting all the claimholders to consent to put all their claims into one company, and thus prevent the incubus of a mining board and other conflicting interests.

The question of our future supply of fuel is beginning to cause some little anxiety, and persons who are the owners of well-wooded farms cannot fail to make large fortunes. The electric light has been introduced successfully into this place, and the Kimberley Waterworks advance rapidly towards completion. I regret to say there is a great deal of sickness in this place at present.

News from the Tatin gold fields is very satisfactory as to the quantity of the precious metal found; but I sincerely regret to hear of the death (from fever) of Mr. William Francis, who obtained a concession from the chief of the Matabeles to work quartz or other reefs. At the time of the dispatch of this said news the whole of the Europeans were prostrated with fever. At Lydenburg gold fields (Transvaal) the excitement which was got up for the purpose of trying on a big swindle in Europe is subsiding. The old diggers, who have been working their claims for some years, are doing fairly well; and the one place belonging to Lockheed and party at Pilgrim's Rest, and the property belonging to White, Cope, Hampson, and Co., at Waterfalls, are turning out very well. At Spitz Kop there is not much doing at present; but I learn from a gentleman who is an authority on the matter that there are three places that are worth the attention of a good company. On the strength of these good or promising places attempts are being made to float some really worthless concerns, and if the parties succeed it will, of course, bring discredit on the whole place, and the fairly good concerns will not receive the attention they deserve. It is, therefore, absolutely necessary that intending investors should be guided by the opinion of some trustworthy person who is competent to give an opinion on the matter. I have just ascertained that hundreds of head of cattle

stolen from our old ally Mankorane are brought here, and sold on the Kimberley market. A special despatch is now being issued by the Diamond News, which says:—

THE WAR ON THE NORTHERN BORDER—LATEST AND AUTHENTIC PARTICULARS.—Late last night we received a despatch from Taung, brought by a messenger, who left Mankorane's head-quarters on March 18. From this despatch we learn that three separate attacks have been made on Taung by the Boers, the rebel Korannas, and the Batlapini. On each occasion the attacking party were repulsed, the Boers commandant and one of the Batlapini chiefs fell. Mankorane people are in much better spirits, several of the petty chiefs having deserted the rebels and joined Mankorane. It is thought improbable that Taung will be again attacked unless the attacking force is strengthened by reinforcements already sent from the Transvaal. The Boers have, however, made a successful raid on Mankorane's cattle post, Thomeng killing and wounding several of the herds, and capturing children and cattle. From Malappo we learn on good authority that Montaleu repulsed an attack on the 17th, the Boers being driven back with heavy loss of men and cattle. We are hourly expecting further intelligence.

Kimberley, March 23.

CORRESPONDENT.

## THE GOLD FIELDS OF INDIA.

SIR.—Captain Rogers' amusement and surprise on reading my letter in the Journal of April 8 may possibly be genuine, but those acquainted with him know him to be such an inveterate joker that, really, even they have hard times of it to discover whether he is in earnest or "on the bluff" (as the Americans say) unless they are well up in the subject, which he, at the time, is desirous of demonstrating, although at times he carries his joking so far that even the most disinterested can see, through his jokes, the object at which he aims. It is very evident from his letter that his surprise is real and his amusement feigned, as he has not attempted to refute any arguments in my letter which appeared in the Journal of April 8, or to answer directly any questions asked therein. His repudiation of the hint at "coercion" does not in any way show that such is not the case, neither do I say that it is so, but there are many ways in which coercive measures may be brought on and enforced, both by ones own actions and proceedings in a particular matter, and by the will and actions of others, that unless one has a will and judgment of his own, and a determination to carry out what is right in spite of all hints and wishes to the contrary, he may be unwittingly or willingly forced into it, and as I know that attempts in that direction have been made with other mine managers in different places, I cannot relieve myself of the impression that Captain Rogers may possibly have been a victim to such measures, whether wittingly or unwittingly I cannot say. Let it be remembered that in his first reports on the Mysore mines, about a year and a half ago, he stated that "there were hundreds of tons of quartz on the surface that would pay for crushing," his subsequent reports stating that he had cut quartz lodes of great magnitude, and his statement in his last week's letter that over 1000 tons of quartz is on the surface ready to crush, and that in some places the lode was "over 20 ft. wide." Let it also be known that trial crushings on a small scale with a mortar mill had been carried on at the mines without producing any result at all analogous to even his statement of 6 dwts. per ton, and that crushing with the elephant stamps had been carried on, according to his own statement, for three weeks—but I have reason to believe the time extended many days over that period—without making a clean up, although Captain Rogers in his letter states that quartz was "gold producing." It was a very unfortunate circumstance that prevented him from amalgamating the blanket sand in the new mill, although he had from October 29 to about the middle of January, when he left the mines, to do it in. According to Capt. Rogers' own statement he must have crushed close on to 100 tons of quartz with the elephant stamps, and this quartz "gold producing," surely he should have been able to find some gold, and the excuse of not being able to amalgamate the blanket sand is a very lame one indeed, and cannot possibly go down with practical men; it may do very well to tell to those that know nothing about the matter. Why! I would have amalgamated it in an old wheelbarrow or something of the kind, or even got the coolies to pan it out but that I would have got some gold out of it if it was there, although Moses' rod might have been a very great auxiliary in carrying on crushing where the water required had to be brought to the stamps in chatties on coolies' heads. Con.—How many coolies would be required to supply two pairs elephant stamps and a 30-head gravitation stamps with water by carrying it in chatties, each containing about two gallons, distance, say, about half a mile? The adaptability of the elephant stamps for quartz crushing was first tried at the Sandycroft Foundry, and at the Millwall Docks before they were sent to India, therefore Captain Rogers' statement that they were worked there for that purpose is extremely absurd; besides, it is well known with what *celat* it was published to the world that "regular crushing had commenced at the Mysore mines" when the elephant stamps went to work. If it was only intended as a trial for the stamps, why was it published as "regular crushings had commenced?" I answer the question in this way: had there been gold found in paying quantities, or even less, it would have been continued as a regular crushing, notwithstanding the fact of its being conducted under many disadvantages, but on finding it worthless crushing was discontinued, and the report made that it was only a trial of the stamps. Will Capt. Rogers explain why the 30-head gravitation stamps were not completed? the engines for driving which were in place in June last, the boilers fixed, and preparations made for the erection of the batteries, and why this work was stopped to go on with the trial of the elephant stamps.

Capt. Rogers' undisguised pretence of mystery at the "rap over the knuckles" shows how far he is capable of carrying a joke. I can very readily believe his statement that "perfect harmony existed between himself" and the directors during his "stay at the mines," except when he was reminded that "he should not have written such a report, as it was very damaging to the property." I very well remember Capt. Rogers telling me of the great things he had there, but I do not remember ever having received an invitation to go underground in the mine, neither did I wish to do so, as I very well knew that the appearances at surface did not warrant what I heard of the great things below. It is very evident to all who make even a pretence of knowing anything of practical mining that when great things are reported to be going on below the surface soon presents an indication of it. I must thank Capt. Rogers for his explanation about trap and basaltic rocks, as also for the list of the minerals found in such rocks, but he had not vouchsafed an answer to my question as to "where paying gold mines may be found in basaltic formations?" In defending myself from the attacks of the directors of the Great Southern Mysore Company I had no intention of commenting particularly on the affairs of any other company only so far as was necessary for my own defence, but if parties connected with other mines commence picking at me they must be content to have things shown in their true light, whatever the consequences may be. And I would further remind Capt. Rogers of this adage—"Those who live in glass houses should not throw stones." After Capt. Rogers' repeated assertions of "quartz in abundance," and "gold in good paying quantities" in the Mysore Company's mine, I think many of the readers of your Journal will agree with me that it is a great pity he was not allowed to remain there to make his assertions good, as I fear there are very few others who will be able to do so. On the other hand, if his repeated assertions have been proved to be fallacious and misleading, then it was quite right that he should have been superseded. At any rate, that Capt. Rogers' assertions have been more or less misleading appears to be sanctioned in Mr. Bell-Davies' report, when he recommends that "no crushing should be commenced until a greater depth is attained." In the name of common sense, I ask why crushing should be delayed, if, as may be gathered from Capt. Rogers' assertions, there are so many thousands of tons of quartz that will pay so near the surface, and which may be taken out so easily? Were I the manager of a director, or a shareholder in a mine containing such untold wealth, I should not rest quietly month after month while no efforts were being made to return some of it. For paper mining it may do very well, but it is hardly calculated to suit the pockets of those who find the means for providing machinery, &c., to work mines in reality. Some properties, while they show nothing really valuable, may possess certain features which would warrant any one in saying that it was worth prospecting in hopes that something good might be met with. Other properties will neither show one thing or the other, and in this latter class I hold the Mysore-Colar district belongs, notwith-

standing that a few ounces of gold may now and then be met with. "A single swallow does not make a summer," nor a few good specimens of mineral a good paying mine. "The test for a pudding is eating it," and a test for a mine is the actual return of the mineral reported to be in it. Judging from the published returns from the Mysore Mine, it has not proved itself very palatable to the outside shareholders, whatever benefit the few may have derived from it. *Cornwall Road, Ladywood, Birmingham.* CHARLES F. BRAY.

## GREAT SOUTHERN MYSOORE GOLD MINING COMPANY.

SIR.—Referring to Mr. Moon's letter, in last week's Journal, concerning my statement about the few specks of copper pyrites which he showed me late one Saturday night, when I did not, as he states, venture an opinion to him, and which I treated as a joke and a bit of satire on the district, and mentioned in my letter of Feb. 18 in such a spirit, I am very sorry that he, knowing all the circumstances of the case, should have looked on it in any other light; but I can readily imagine why he should have allowed himself to be carried away with this idea just about the time he received a telegram from London, advising him that he had been superseded by Dr. Atcherley, late manager of the Great Southern Mysore Mine, and, consequently, that his term as manager was very nearly at an end. Probably Mr. Moon is the manager hinted at in the Journal of the 8th instant as having been ordered to quit forthwith because he did not believe in the gold-producing qualities of the Colar district. Surely actions speak louder than words.

CHARLES F. BRAY.

## MYSOORE GOLD MINING COMPANY.

SIR.—With reference to the working of the stamps at this mine, Capt. Rogers states in last week's Journal the "stamps only worked three weeks, and during that time four to five hours per day, consequently the number of tons reported to be stamped is not correct." Why does not Capt. Rogers state what number of tons was stamped, and how can he reconcile his statement that the stamps only worked four or five hours per day with the statements in his letter to the directors of Oct. 17, 1881? "I am pleased to say these (the Elephant stamps) have been working steadily for the last week, and this week I shall clean-up the rock, put through and commence on quartz broken on Rodgers' lode." Again, on Oct. 24, 1881—"I am pleased to say these (the Elephant stamps) continue to work very well, and doing good duty. It is our intention to partly clean-up, when I will send you the result as far as gone." Therefore, for 14 days the stamps were doing "good duty," and it is not until Oct. 31 that he writes—"The stamping has been carried on under great difficulties owing to the great scarcity of water." Now, which are true—the statement in the letter to the directors, or those in Capt. Rogers' letter in the Journal of Saturday last? In the directors' report extracts from Capt. Rogers' letters are given as late as Nov. 14, but there is no intimation given of any clean-up being about to take place, nor any valid excuse for its having been delayed, nor allegation that the quartz was of "the very poorest quality," as he now states. If, as Capt. Rogers states, the true reason of the stamping being suspended is the want of water, I cannot compliment him on the want of foresight he has displayed in not having excavated reservoirs in which to collect during the rainy season sufficient water to supply the stamps. If he hopes to pump sufficient water from the mine for that purpose the heavy cost of keeping the water will, I fear, render the profitable working of the Mysore Company's mine utterly beyond the range of probability or possibility.

April 21.

AN UNBELIEVER.

## MYSOORE REEF GOLD MINING COMPANY.

SIR.—The attention of the directors of this company has been called to a letter in last week's Journal from Mr. Moon, their late manager in India, from which the following is a quotation:—"In the Journal of Feb. 18 is a letter from Mr. C. F. Bray, late manager of the Great Southern Mysore Mine, in which he says—'As to the quartz carrying sulphurets, there is not a bit of anything of the kind to be found on the company's claim; and the only place I ever saw a bit of anything of the kind was a few small specks of copper pyrites which the manager of the Mysore Reefs brought to show me, thinking it was gold.' As the manager referred to I beg to contradict this statement. I showed the sample to Captain Jay, I also showed it to Captain Jarvis, of the Madras Mine, expressing my belief that it was copper pyrites, but in this neither of these gentlemen agreed. I said, well, whatever else it may be, I am certain it is not gold. A few days afterwards I saw Capt. Bryant, of the Ooregum Mine, and showed it to him. He at once said—'It is copper pyrites, for you know I am at home amongst copper pyrites.' As a personal favour I ask the insertion of this letter, as it would be a very serious matter for anyone in my position to be supposed incapable of distinguishing between copper pyrites and gold."

In order that a just value may be placed upon Mr. Moon's statements I have to request your insertion of the following extract from a letter addressed by him to the directors of this company from the Mysore Reefs Company's Mines, under date Oct. 15, 1881:—"Since writing the above I have got some stone from Dr. D. in which is a metal which if not gold I do not know what it is. My belief is that it is gold containing a large percentage of silver, because under the influence of nitric acid it becomes more gold-like by the silver being dissolved by the acid. I showed several specimens to the miners at work at the Great Southern Mysore Mine (near here), several of whom had experience in Australia, California, Siam, Brazil, &c. They all pronounce it gold. I still doubt it. Capt. Jarvis, of the Madras Mine, states his belief that it is gold. Capt. Bray and Mr. Meath, of the Great Southern Mysore, are puzzled by it."

Oct. 15.—To-day's post brought me in the report of the assay of the stone sent to Madras. From it you will see that the stone contains a small percentage of silver. This strengthens my belief that the metal discovered yesterday is gold, containing much silver."

There can, I think, be no doubt of the identity of the two incidents referred to in the above extracts.

Bishopsgate-street, April 20. HUGH W. TULLOCH, Secretary.

## INDIAN MINING—SOUTH-EAST WYNAAD.

SIR.—I observe that in the report of the meeting of the South-East Wynaad Company, in last week's *Mining Journal*, Mr. O. Pegler stated that he had inspected all the gold bearing reefs in that (the Wynaad) district. As one interested in the Simons' Reef and Carta Para Companies I should much like to know—and doubtless many others would also like to know—whether he inspected the great reef which is described as running right across the whole of Simons' Reef Company's Estates? and if he did inspect it what he thinks of its value and of the prospects of the Carta Para Company? By the way no reports from this company's officers in India ever appear in the Journal. Why is that I wonder?—*St. Leonards, April 17.* P.

## THE GOLD FIELDS OF SOUTH AFRICA.

SIR.—Whilst the Kimberley Correspondent of the *Mining Journal* confined his remarks to the diamond mines and diamond companies of South Africa, although I understood the motives that dictated them, I did not think it worth my while to criticise them, for I saw that other and abler pens than mine had taken them in hand. But now when I find the same Correspondent attacking my private concessions in the gold fields of that country, and by insinuations endeavouring to get the British public to suspect that my co-partners and myself are bent on inducing the capitalists of this country to invest in the Tatin gold fields by bribes and other malpractices, I think it due to myself and my co-partners to offer a remark or two on the letter of the "Correspondent" which appeared in the *Mining Journal* of April 8. He writes:—"News from the Tatin gold fields is of a very satisfactory character as to the yield of gold, but the latest private advices state that the natives are in such a ferment that they (the diggers) expect to have to retire into the interior for safety. If any English speculators become infatuated with any gold samples they may see exhibited I should advise them to get the place inspected by an experienced man who is above being bribed, and whose head is not turned by the sight of a few ounces of gold." Of course the object is to get "the experienced man," a new title for "The Mining Engineer," who "Correspondent" co-operates with, into a job which would bring him a handsome sum as commission. I venture to say that I have had as much experience in gold fields as any man that the "Correspondent" has in his eye. I have since 1859 been constantly at work in diggings in Australia, New Zealand, and South Africa, and my head is not likely to be "turned by the sight of a few ounces of gold." In 1869 I crushed for the Australian party, of which I was one, Tatin quartz giving 11 ozs. to the ton, and 600 lbs. of quartz I brought home to London from the Tatin was



assayed by the well-known assayers Messrs. Johnson, Matthey, and Co., and yielded over 4 ozs. to the ton. I venture to say that the Tatin gold fields will be rich and profitable. The "Correspondent" appears to be bent on depreciating every industry in South Africa which his "experienced man" cannot get his thumb upon. The statement about the "natives being in a state of ferment" is another invention of the enemy, and like all such inventions, maliciously untrue. The natives are civil and obliging, and since we have taught them to work for wages they have come to be industrious. Lo Bengulo, the chief, is as friendly as a chief should be. D. FRANCIS.  
Fairlop Lodge, Leytonstone, Essex, April 20.

#### THE WEST AFRICAN GOLD MINES.

SIR,—Will you kindly permit me to correct a few errors which have crept into my letter printed in last week's *Mining Journal*? The official designation being "The Gold Coast Colony," Colony should be written as in my manuscript, and not with a small c. Your printer makes me speak of *Maderia*, whereas I most distinctly wrote *Madeira*, the correct name of the island. I wrote by "boat and canoe," not *canal*. "Eminently auriferous," and "showed bright spangles of gold," being quoted from Captain Burton's letters, should have appeared in inverted commas, as written by me. I quoted Captain Burton's own words, that he "had seen or heard nothing to shake his belief in their magnificent future," but this has been altered to read that he had "seen or heard nothing to shake my belief, &c.," a different matter.

As Captain Burton is expected to land at Liverpool on May 18, and is announced to lecture on May 23 on the West African Gold Fields at the Society of Arts, the public will very shortly have the opportunity of hearing from his own lips his opinion, not only of the mines, but of the climate and of the labour question. May I ask if your correspondent, Mr. Del Mar, is not rather too hasty and sweeping in his condemnation of the West Coast of Africa as a gold field simply because, in one instance, he found neither water nor dumps at a spot which he visited, and which he admits is "rich enough"? And what experience has he had of the climate? Probably merely that of a visit extending over a few weeks, whilst his inspection of the auriferous deposits was apparently confined to a very limited area.—April 19.

R. B. N. WALKER, F.R.G.S., &c.

#### GOLD MINING IN INDIA.

SIR,—Before attending the meeting of the South-East Wynaad Company on Thursday last I had been present at a meeting of the Sierra Buttes Gold Mining Company and was much struck by the similarity of circumstances as described by Mr. Cooper at the former, and very lucidly by Mr. Tendron, the newly elected chairman of the latter company. The statistics given in the Sierra Buttes report are very carefully compiled, and I think give a very fair indication of what may be expected from good Indian reefs according to Mr. Cooper, Mr. Harvey, and other reliable mining experts. The two mills of the Sierra Buttes Company yield on an average of the past six months bullion valued at \$6 10 23 c. per ton. This, valuing the gold at 37. 10s. per ounce, is exactly equal to 7 dwts. per ton. The capital of the company is 245,000*l.* and more than the whole of it has been returned to the shareholders in eight or nine years, while, apparently, steady dividends are in prospect for many years to come. The rate of wages paid in the one case is \$2 per day, with additions in the shape of feeding facilities, say nine shillings; in India the wages are nine pence, and the capital of no single Indian mining company at all approaches 250,000*l.*; the average in fact will be about half this amount. The reefs are very similar—gold freely disseminated in quartz; in fact the sketches shown at the two meetings might almost have been interchanged, with this exception, that the Sierra Buttes plan showed a vast amount of heavy work, adits being driven in some cases 1000 yards before striking the reef.

The conclusion is, I think, obvious that if the Sierra Buttes Mine pays so well with 7 dwts. per ton, the Wynaad Reefs will do equally well with 5 dwts., looking at the difference in wages. I may assume the cost of machinery and fuel to be the same in both cases, although India would perhaps have an advantage, and the present depression in Indian shares is just as unreasonable as the previous inflation.

#### WHENCE SHALL WE OBTAIN MORE GOLD?—No. III.

SIR,—My first letter showed that the current supplies of new gold were far behind the requirements of the arts and the mints. My second letter showed that beside the countries which furnish the current supplies (California, Australia, and Siberia) there were no other countries except, perhaps, possibly Brazil, to which we had any good reason to look for important supplies in the future. The present letter will be devoted to Brazil. Before going any further I ought to say that since the first letter of this series was published I have received communications from several gentlemen asking me to include certain gold mines and gold districts in my survey. One was interested in the Land of Midian, another in the "veritable Ophir of the ancients," a third on the "Golden Chersonese," &c. These gentlemen mistake the scope and aim of these letters. These are not to puff gold mines nor mining projects, but to faithfully answer the question which stands at the head of the letters. And in respect to Brazil I may as well say right here that my careful investigations ended in disappointment. The auriferous districts in that country are probably greater in extent than elsewhere, yet it is much to be feared that Brazil will never again become a great gold producing country; but I am anticipating.

Brazil was discovered by Vicente Yañez Pinzon, a Spanish captain and companion of Columbus, in January, 1500. It was re-discovered and more completely explored in the following April by Pedro Alvarez de Cabral, a Portuguese navigator, and also by Americus Vesputius, in 1503. Notwithstanding the blundering Papal Bull which gave to Spain all that portion of the Indies discovered west and "south" of a certain meridian line, Spain neglected to urge her claims to Brazil, and Portugal retained a nominal possession of the country, by the explorers of that period, whose sole object under whatever specious guise was the direct acquisition of the precious metals, this country was esteemed of no value until 1549, when bits of gold used as ornaments being found upon some of the natives, the presence of alluvial gold in the river sands was suspected, and Brazil came to be regarded at the Portuguese Court with more interest. Before any practical results followed—to wit, in the year 1555—Villegagnon, an adventurous Knight of Malta, applied to Admiral Coligny, of France, for leave to invite the Huguenots of that country to found a colony in Brazil. Coligny being favourable to the project obtained permission from Henry II., and in the course of two years time some 10,000 Huguenots were sent to Brazil, where they established a settlement upon the strip of sandy beach which is now the site of Rio Janeiro. The inaccessibility of the surrounding country, which consisted of precipitous mountains densely covered with bush, and the hardships of a pioneer life, soon outweighed the advantages of religious liberty and the charms of a semi-tropical climate. It was also discovered that Villegagnon's religious zeal was a sham, and that his chief solicitude was to capture the natives and plunder them of gold. These circumstances, together with Villegagnon's tyranny towards the colonists, drove them back to France, and four years later the Portuguese took possession of the settlement and established their flag along the entire coast. This was no sooner effected than numerous expeditions were organised from the settlements, all of which were upon the seaboard, to penetrate the interior country, capture the natives, extort gold from them, and reduce them to slavery. To effect these objects without exciting the opposition of either Church or State the expeditions were ostensibly undertaken in the name of religion, to christianise the natives and teach them the word of God; and grants of Indian lives (encomendas) were obtained from the Crown, so many to each horseman, so many to each footman, so many for the Crown, so many for the Church, and sometimes an allotment to the bloodhounds, the latter being employed to hunt down the naked and unarmed aborigines.

These false and cruel measures which were faithfully copied from the Spaniards in the West India Islands, Mexico, Guatemala, and Peru, did not prove to be of equal efficacy in Brazil. This country,

unlike the others, was neither an island, an isthmus, nor a narrow coast line closed in by snow-capped mountains. Brazil had a vast interior to which the natives could and did retire so soon as the true objects of the white colonists became manifest, and to this circumstance it is due that the alluvial gold mines of that country are not so thoroughly exhausted as were those of the Spanish islands and main. In the latter the natives were captured and doomed to the mines and to insufficient nourishment, until no more gold was to be obtained. In Brazil native captives became scarce long before the mines became poor, and negro slaves had to be imported from Africa to supply the places of the natives. As the negroes were expensive to procure, it did not pay either to work them to death or to neglect their proper nourishment and care. This degree of immunity led to important economical results in the production of gold. It was while engaged in one of their numerous expeditions to capture natives and plunder the gold found upon them or in their villages, that the Portuguese first came upon gold in placers. This discovery was made in 1573 by Sebastiao Fernandes Jourinho, who commanded an expedition to explore the natives on the Rio Doce, in Minas Geraes. The gold was found in the sands of that river, and a quantity of it in nuggets and grains was brought to the coast. This expedition was followed by many others with similar results until the coast settlements accumulated quite a store of the precious metal, part of which was obtained by plunder and part by discoveries similar to that of Don Sebastiao. But owing to political events in Europe these expeditions met with discouragement, and were not resumed for nearly half a century, and a whole century elapsed before mining in Brazil became a settled pursuit of the Portuguese colonists. During the latter part of the 16th and early part of the 17th centuries the English and Dutch then at war with Spain and Portugal attacked and plundered the coast settlements in America. In 1624 the Dutch captured San Salvador, with immense booty in gold. In 1630 and from 1633 to 1636 they sacked nearly all the Portuguese settlements on the coast of Brazil, and established Dutch colonies in their places. But in 1654 the Portuguese again obtained possession of the country and retained it until it achieved its independence in 1822.

In 1594 a French expedition explored the Amazon river. In 1625 a Capuchin friar, Christovao de Lisboa, set out from Para and discovered the river Tocantins, reputed to be rich in gold; in 1640 a regular gold expedition explored the Tocantins. In 1662 Fernando Dias Paes Leme discovered the gold placers of Campanha in Minas Geraes; and in 1669 Goncalo Paes and Manoel Brandao pushed gold discovery on the Tocantins up to the point of its confluence with the Araguay. In 1670 two expeditions, and in 1672 one expedition, for captives and gold were organised at St. Paulo. The first of these expeditions discovered the placers of Jaraguá; the second, under Manoel Correa, discovered those of Goyaz; and the third, under Pascoal Paes de Araujo, traversed the whole of Goyaz, penetrated the districts of Piahy and Para, reduced a tribe of Guarajus Indians to slavery, and obtained much gold. This expedition forms the distinctive beginning of gold mining in Brazil, and as Pascoal was a native of St. Paulo the discovery of gold has come to be attributed to the Paulistas. The impetus given to gold searching by this expedition soon led to the discovery of numerous placers, principally in the capitanias, now the provinces, of Minas Geraes, Goyaz, and Matto Grosso. The most notable of these are mentioned in the following—

#### CHRONOLOGICAL TABLE OF GOLD DISCOVERIES IN BRAZIL.

- | Year.    | Province.  |
|----------|--|
| 1693.    | Minas Geraes.—Antonio Rodriguez Arzao and Carlos Pedroso da Silveira, with 50 men discovered an Indian village on the river Doce, which they named Cathay, and from which they plundered 3 oits. of gold, said to be the first product of Minas Geraes.                          |
| 1694.    | Minas Geraes.—Expedition of Bartholomeo Bueno. Much gold obtained, and 12 oits. presented to the Governor of Rio de Janeiro.   |
| 1694.    | Minas Geraes.—Bartholomeo's success leads to several expeditions from St. Paulo. These plunder the Indian villages on the rivers Taubaté and St. Paulo, open numerous placer mines in Minas Geraes, and organise a regular system of gold caravans from the coast to the mines.  |
| 1694.    | Goyaz.—The Paulistas also discover numerous placers in Goyaz. 1695: First Portuguese Governor of Brazil appointed.   |
| 1700.    | Minas Geraes and Goyaz.—The yield of gold became so prolific and the difficulty of obtaining supplies from the coast so great that in this year the price of maize flour at the mines was 40 oits. the alqueire (20 <i>l.</i> the bushel), and of beans 40 <i>l.</i> the bushel. |
| 1701.    | Minas Geraes.—Placers of Villa Rica discovered.  |
| 1715.    | Minas Geraes.—Placers of Villa do Principe discovered.   |
| 1718.    | Matto Grosso.—Numerous small placers discovered.   |
| 1719.    | Matto Grosso.—The first important placer in Matto Grosso discovered; that of Cuxipo Mirim, on the river of the same name, one league from Cuyabá.  |
| 1721.    | Matto Grosso.—Placers of Cuyabá and Rozario, near Cuyabá, discovered by Miguel Subtil. The latter yielded in one month 400 arrobas (640,000 <i>l.</i> )  |
| 1722.    | Goyaz.—Expedition of B. Bueno. Gold discovered in sands of Rio Vermelho.   |
| 1726.    | Goyaz.—Numerous placers discovered. Within 20 years 273 placers were opened and worked by forcing the natives into them until they expired. In 1736 an improved route was opened from the sea-coast.   |
| 1738.    | Matto Grosso.—Placers of S. José de Cocoes, six leagues from Cuyabá, discovered.   |
| 1739.    | Matto Grosso.—Placers of Arinos discovered 10 leagues north of Diamantino.   |
| 1740-50. | Matto Grosso.—In 1741 were discovered the placers of Arraial Velho, one and a half leagues north of Diamantino, and between 1740 and 1750 those of Brumado, six leagues south-west, and of Pari, three and a half leagues south of Diamantino.                                   |

At this period the auriferous districts were all or nearly all discovered; and the annual product of gold was 5,000,000*l.* In the course of another decade this began to decline. The auriferous country was found to be principally in Minas Geraes, Goyaz, and Matto Grosso, on the northern and western flanks of the Sierras Mantiqueiras and its numerous spurs and subsidiary hills (morros). In my next letter I will describe the present aspect of this country and its resources for gold mining.

ALEX. DEL MAR, M.E.

Groveport Hotel, April 18.

\* Previous to Nov. 9, 1709, Minas Geraes formed part of the capitanias of Rio Janeiro and S. Paulo. From 1709 to 1720 it formed part of the capitanias of S. Paulo and Minas, and after Dec. 2, 1720, it was separated from S. Paulo and formed into a capitanias by itself.

#### RICHMOND CONSOLIDATED MINING COMPANY.

SIR,—In reply to "S. H.'s" letter in last week's *Journal* and the novel idea of purchasing the Albion shares, the directors of the Richmond Company are, in my judgement, thoroughly up to their work, and ever watchful over the interests of this vast and valuable property. As a large shareholder I should like to see some one appointed to work in conjunction with Mr. Probert in the various developments of the mine. Mr. Probert has proved himself to be most earnest and energetic and in every way equal to any emergency that may arise, but the strain upon health and strength is too great for any one man, and the interest at stake also in this immense property is too much to be controlled by him alone, and past experience has clearly demonstrated that there must be the most practical and responsible supervision, to secure the efficient management of this property, and unless something is done shortly I fear we shall drift from bad to worse. The property is there but the management absent. There has been no responsible controlling power continually at the mine ever since Mr. Reuben Rickard left, and it is a positive fact that since he left the mine has not shown such good results, and I attribute all this to the want of better management and more personal supervision. We want a second Reuben Rickard, in whom we can place the most implicit confidence and rely upon his practical ability and mining experience to develop those parts of the mine where there are still large bodies of rich ore; but it requires a mining

agent of the first order to direct these explorations, and until this is done I see but little if any chance of improvement taking place. We must not forget that from the period that Mr. Reuben Rickard left our property has decreased in value nearly 400,000*l.* This is a significant fact. I should like to know if there is any reason or insurmountable difficulty why Mr. Probert and Mr. Rickard could not become joint managers and work concurrently and direct the various important points for future developments. There must be no delicacy of feeling on the one part or the other. The common interests of the shareholders demand that some such arrangement should be brought about, for if the depression is allowed to go on and chaos reign in the mine, which has of late been the case, the responsibility will fall most heavily upon the executive; but if such a happy arrangement could be arrived at, that Mr. Probert and Mr. Rickard should work as joint managers, I feel confident it would result in great good to all, and our property would soon emerge from this state of doubt and uncertainty and cease to supply such tempting food for the "bears," and the shares would soon reach their old value again. The mine is not wanting in wealth, but in management and mining genius to direct and develop those bodies of rich ore well known by mining experts to be there. A LARGE SHAREHOLDER.

#### RICHMOND CONSOLIDATED MINING COMPANY.

SIR,—I notice in last week's *Journal* a letter from Mr. Hubert Akers, the secretary of this company, in which he states that the accounts in the Eureka local papers, which were copied into your *Journal*, convey an exaggerated impression as to the extent and importance of the robberies of ore from the Albion disputed ground, and exchange of good ore for low grade by the Richmond tributers. Now, although it may in one sense be satisfactory to know that the company has not been defrauded to the extent reported, and therefore that the officials at Eureka have not been guilty of such an extent of carelessness as was supposed, yet to those who, like your correspondent "W. H. K.," drew the inference that the falling off in the returns of the quantity and quality of the ore produced might be accounted for by the fraudulent practices referred to, such a statement is somewhat discouraging, as taking away the ground of confidence in an important improvement of the mine consequent on these practices being stopped. I think it would have been satisfactory to the shareholders if the secretary, instead of merely denying the extent of the robbery, had gone a little more into particulars and had given some account of the actual extent of the losses sustained by the Richmond Company, as some estimate must have been formed, from the fact of exaggeration being charged to the papers published on the spot; but I suppose this information is reserved for the general meeting in May. I have advocated in previous letters the purchase of the Albion Mine by the Richmond Company, and I have done so because the disputed ground is said to be full of valuable ore, and the two mines being contiguous could no doubt be worked more economically by one company than by both, and by possessing itself of the Albion Mine, the Richmond Company might be enabled to increase the returns to the old standard of 1000 tons per week, and to maintain the dividends of 10s. per quarter. I know no policy so likely to corner the "bears," who are said to delight in making a kind of Stock Exchange or football of the shares of this company. There are 150,000 shares of the Albion Company, the present value of which is 23*l.*, or 10s. per share, so that if all the shares could be obtained at this price, the amount of the reserve fund of the Richmond Company would suffice to buy the Albion Mine. I have taken some pains to ascertain from a correspondent at Eureka what is the opinion on the spot as to the time the ore reserves in the Richmond Mine are expected to hold out, and I am informed that the present rate of production, about 500 tons per week, cannot reasonably be expected to continue much beyond two years in the absence of new discoveries.

It appears to me to be very important that there should be some means adopted to keep the mine going without depending too much upon chance of ore being found in the lower levels. Of course we have all been expecting for some time past that a valuable discovery would be made between the sixth and twelfth levels, but the recent explorations have been disappointing. Whether they have been carried on as skillfully as they might have been is a question which may arise. Of one thing the directors may feel assured, that is that the shareholders will desire the early appointment of a competent manager, whose whole time shall be expended in the service of the company.—April 19.

S. H.

#### RICHMOND MINING COMPANY.

SIR,—As there has been a good deal of correspondence in the *Journal* on the recent judgment in the suit of the Albion Mining Company against the above company, it may interest many of the shareholders to read the judgment as given, and form their own opinion thereon. I, therefore, send you two copies of the Eureka Sentinel, one giving the full text of the judgment, which was unanimous, and the other a summary of the judgment. The former is, of course, too long for publication in the *Mining Journal*, but the latter will certainly interest Richmond shareholders. It appears to me that the time has passed for the purchase of Albion shares by the Richmond Company, and the shareholders had better make up their minds to look to their own mines. There is plenty of ground yet left, but it may take time to find bodies of ore such as have until recently been so successfully worked.—London, April 17. A WELL-WISHER.

In the shorter statement it is remarked that the decision of the Supreme Court in the great Richmond-Albion case, which was carried there on appeal after being tried in the District Court of the Sixth Judicial District at Eureka, last July, has been looked for with a great deal of interest and solicitude. It has come at last, and is everywhere the subject of comment and congratulation in the community, except among those whose individual interests would have been subserved by a contrary decision. We publish below a satisfactory summary of the opinion of the Supreme Judge, which is the opinion of the full bench. The report is authentic, and may be relied upon in every particular, coming from the clerk of the Court, Hon. C. F. Bicknell, who is an exceedingly careful and accurate officer, and who has the Court record in his own keeping.

There are many persons who have not heard a statement of this great case, and there are others who have forgotten the circumstances; hence it will be in order to review it here in a brief outline. The impression is somewhat general that the case involved difficult and obtrusive questions. The fact is exactly the reverse. Rose and others on Jan. 14, 1872, located a claim for 600 ft. on the Eureka lode, and their grantees have ever since worked and possessed the same according to law. In March, 1873, the Richmond Company, through its President, at that time John J. Carrigan, located 1500 ft. on the same lode, called the St. George claim, which conflicted with the claim of Rose and others. In 1873, having secured a deed to the property from Carrigan, they applied for a United States patent. Rose and others protested, and all proceedings were stayed in the Land Office. In due time Rose and others instituted a suit to determine the right of possession. While this suit was pending and undetermined, and while all proceedings were stayed, and while the officials of the Land Office had no authority to act in the premises, the Richmond Company obtained therefrom a patent. After obtaining such patent the Richmond Company put in an amended answer in the case formerly commenced by Rose, setting up what is known as the St. George patent. The case of Rose and others was commenced and prosecuted as required by law, and the Court had full and competent jurisdiction when the pretended St. George patent was issued from the Land Department. It is now conceded that a patent cannot issue under such circumstances. Secretaries Schurtz and Kirkwood have so held, and our Supreme Court have just decided in the same way. The claim of Rose and others, now owned by the Albion Company, is admitted to be prior to the St. George claim, and with equal certainty prior to the Victoria patent, which was obtained as the St. George patent, only later. The decision of the District Court was that the Victoria patent is valid, and that on the one lode theory it took in the Uncle Sam claim. The discussion of the Victoria patent, however, cut no figure in the trial, and the argument of the Richmond counsel was to establish the right of possession in themselves as proprietors of the St. George patent. The Victoria patent, in fact, had been before Judge Rising, sitting for Judge Rives on the bench at Eureka in the hearing of the order of injunction. He merely inquired its date, and finding that it was later than both the St. George and Uncle Sam, decided from the bench that it cut no figure in the case.

SUPREME COURT DECISION.—Carson, March 17: The Supreme Court has decided the case of the Albion v. Richmond Mining Company; the decision is quite lengthy, and discusses every question presented by counsel; it decides: 1. That the statement on appeal is sufficient.—2. That there is a proper specification and assignment of errors.—3. That the complaint states facts sufficient to constitute a cause of action.—4. That the action was commenced in time.—5. That plaintiff's protest sufficiently shows the nature of the boundaries and the extent of the Uncle Sam claim.—6. That plaintiff had sufficient possession of the Uncle Sam claim and lode to enable them to maintain this action.—7. That the location of the Uncle Sam claim was not void because the locators claimed a discovery interest, that if voidable at all it is only to the extent of excess of 200 ft.—8 and 9. That the St. George and Victoria patents, upon which the defendant relied, are absolutely null and void because they were issued without authority of law during the pendency of the contest in the State Courts, while the lode in controversy was by the provisions of section 2326, revised statutes of



The working of Greatwork was resumed in 1825 by a Helston party, and has continued to work nearly ever since, but latterly on a



small scale. Captain Teague, of Tincroft, is the present owner, and intends to explore it largely. I remember that in the year 1816 Captain Thomas Carter was the principal agent at Wheal Breage, whose son was clerk at Greatwork 40 years. There was another agent at Wheal Breage, called Clement Mollard, who was dismissed because of a joke! A merchant called at the mine when Mollard said, "You had better get your money while there is any left!" or words to that effect. These words coming to the ears of the pursuer (I think Tyacke) Mollard was dismissed at once.

Mr. John Silvester, of Helston, was the mineral agent for several landowners, and was largely connected with Greatwork, Great Wheal Vor, and other mines. He began life as a biddle-boy at about half-a-crown a month. He rose to become the proprietor of the Star Hotel, Helston, which he kept for many years, and then rebuilt it. He was also the proprietor of a great many other houses, and of one freehold farm. He had two sons and one daughter. The eldest son lived fast and died early. The second son was, I believe, killed by a fall from a horse. The daughter married Mr. Jas. Clarke, a spirit merchant and innkeeper at Penzance and Helston, who, with his two sons, used up all that was left of Silvester's savings. The family, I believe, is extinct. "Silvester's Buildings," a mile and a half east of Helston on the Falmouth road, keep the name alive, the words being inscribed in the granite front. Clarke and one of his sons were killed by falls from horses.

Truro, April 18.

#### EAST WHEAL ROSE, TRESAVAN, MOUNT'S BAY, AND OLD SHEPHERDS MINES.

SIR,—Having business in Cornwall in Easter week I took the opportunity of visiting the above properties, and as the information I acquired may be of interest to my many brother shareholders numbered among the many subscribers to the *Mining Journal*, I hope you will give space to this short communication.

**EAST WHEAL ROSE.**—I found the 90-in. engine here almost complete, and the house ready for the reception of the 100-in. engine. These will form by far the most powerful pumping machinery on any mine in England. The agent (Capt. Doidge) and the engineer (Mr. Matthew Loam) have perfect confidence that they have mastered the water difficulty, and that they can successfully drain the old rich part of the mine. Then there is a large area of virgin ground in the sett lying between the old mine and Cargoll, and containing the lodes which proved so rich in both these properties. Middleton's lode, which gave such enormous returns, preserves its old characteristics, and would appear to be as rich as ever, while from the Innes lode an immense pile of beautiful lead and blende has already been raised. The dressing machinery, which a mining engineer told me is the most perfect ever devised, will soon go to work, and shortly thereafter a large sale will be made.

**TRESAVAN.**—The 90-inch engine was started here on Wednesday, April 12, amidst the ringing cheers of a host of miners, who expect this mine to revive all the glories of the Gwennap district. I conversed with many experts on the mine and neighbourhood regarding the prospects of this undertaking, and the unanimous opinion was that the mine is a magnificent property, similar in situation, in history, and in characteristics to Dolcoath. Already from above adit a mass of rich tinstuff has been drawn by a portable engine from Caddy's lode, and trams have been laid down for the transit of the ore to the stamps, which are erected. Crushing and returns will, therefore, commence at once. As regards the old mine Capt. Prisk gave personal testimony at the starting of the engine to the incalculable reserves of tin standing in the various levels ready to be broken as each level is unwatered. To show the confidence of the former owners I was assured that the late Mr. Michael Williams offered to put down 10,000*l.* to work Tresavan for ten years ago. The machinery here is of the most substantial character, and the granite shaft unequalled in the country.

**MOUNT'S BAY CONSOLS.**—At Trebarvah the patience of the agent has at length been rewarded by a good course of copper ore at the 62 ft. level. When I visited the mine a large amount of stuff was being raised and dressed. At Pembro the engine will go to work in a week or so, and the prospects are highly favourable. But Sydney Cove, where the engine has been at work for two months, seems the trump card. It is an immense hill of tin. From the lodes already discovered 20 tons of tin can be stamped monthly, and as this is almost at surface what must the wealth of the mine be in depth? I prophesy several thousands of pounds of profit as the result of the next 12 months working, or sufficient from one of the three properties to pay a good dividend on the entire share capital. Browne's lode, a champion lode for tin, and the famous Great Wheal Vor copper lode will shortly be cut, when returns will be immensely increased.

**OLD SHEPHERDS** is a universal favourite in Cornwall, and is more than a speculation. The western ground is producing fine silver-lead. The 80-inch engine was started on Saturday, April 15. The halvans will be broken up and dressed immediately, Green's dressing machinery being complete. This, without an ounce from underground, will produce thousands of pounds. The building, machinery, and shafts are of the most substantial and lasting character.

In conclusion, I have to invite any experts or shareholders to visit these properties and judge for themselves of their prospects. The amount of solid work done during the last year is astounding. I would make bold also to give shareholders a little piece of advice. While the shares can be got at or below par increase your holdings. They will all run up to high premiums when the truth about them becomes known. I enclose my card, and may say that I have no connection with the direction or management of the mines, but am simply—

London, April 19.

#### MULBERRY TINWORKS.

SIR,—As I know you are always willing to insert particulars of mining properties, and especially if these particulars are of the nature of good news, I have taken the liberty to send you this letter, hoping you will favour it with a place in your excellent Journal. I am happy to inform you and your readers in general that the above excellent property still continues to be prosperous, and its intrinsic worth constitutes it the hope of the neighbourhood. It is of established worth and well-known, and even at the rate at which it has been carried on, has been a great success. But it has long been felt that more extensive operations were necessary, as the tinstuff can be supplied in quantities without limit, and it was only a question of output and reduction of material on a larger scale to secure commensurate increase of profits. This fact has not escaped the notice of some of our mining experts, and consequently the old proprietors have been bought out, and a new company has taken possession of the works. In all matters of this class the elements or conditions of success are—capability of development, intrinsic worth, sufficiency of capital, and spirited operations and management. And all these conditions we are assured are supplied in the present property and company. That the works possess the first two elements is a fact apparent to all, and that the new company possess the latter two we are glad to say sufficient evidence is at hand. We have already remarked that the mine has hitherto worked with excellent results, but on a small scale, and we are glad to be assured that it is a fact that the present company in the short space of one month from completion of purchase have already made provision for an additional hundred heads of stamps.

This is a fact of excellent omen, both for the shareholders and for the neighbourhood, as it will secure much larger returns and create much more employ; 100 additional heads of stamps with material of the soft nature of that produced in these works means the reduction of at least 150 additional tons of stuff per diem, and this is of noble significance for both parties above referred to. It is a good thing for the neighbourhood if capital be brought here and expended for the purpose of working the tin quarry; but it is a matter of extreme gratulation to know that the expending of this money will secure an increase of wealth, using this term, of course, in the sense attached to it by political economists. Here Nature has done her work and deposited the material, which adequate capital and human industry can convert into real wealth. It will, perhaps, be of no particular interest to make formal calculations as to how much these new arrangements will increase both the returns and employ;

it is sufficient to have called attention to the facts of the case, and thus to assure those who spend their money here that they will have their reward. We know nothing of the future intentions of the company except as mentioned, but from present positive arrangements sufficiently known throughout the neighbourhood, it is very evident we may anticipate a very spirited method of working, and that things will be prosecuted to the utmost limit of productive labour; and this is what is really wanted. A thing that is worth doing is worth doing well, and if not worth doing well is not worth doing at all. In conclusion, we would say we wish the present owners every success. They are really doing a good work, and are worthy if much praise both for their energy and their sagacity—i.e., for their sagacity in selecting so good a property and for their energy in prosecuting it when secured. The chief features of this work are—it is both extensive and dividend-paying, certain to last for ages, and can be inspected by anyone that shall happen to visit the locality, as all the workings are open to the day. There is an expression of much pleasure and animation in this locality at the fresh impetus given to operations in the work, as the prosperity of the town will be greatly augmented in consequence.

Bodmin, April 20.

#### PHOENIX UNITED MINES.

SIR,—Referring to a letter from a Shareholder in last week's Journal stating that the business of the mine is conducted in a straightforward manner, allow me to ask him why the ledger balances are not given with the reports in the balance-sheets? The doubt that exists as to what is owing to bankers and others is, I believe, the only reason that the shares are so ridiculously low, and the sooner this matter is cleared up the better it will be for all concerned. It is a very valuable property.

O. P.

#### THE UPPER SEVERN MINING DISTRICT.

SIR,—Will you permit me to say a few words respecting a district that but little is said about, but one that I think deserves much more attention? The district I refer to is or commences about five miles west of the market town of Llanidloes. Following the River Severn westwards, and in the direction of its rise in Plynlimmon Mountain, the first mine we come to is the Old Gifron Copper Mine, from which there were sold some hundreds of tons of a high percentage copper some 30 years ago. The next mines we come to, and about a mile further up, close on the side of the River Severn, is the Great Gias and the Great Ashford Mines—both copper mines. The lodes at these two mines are very large ones, containing a large body of quartz. A very large quantity of copper was taken out of the Great Gias only a very few years since from between the adit level and surface; and as I have understood averaged about 15 per cent. for fine copper, and I have often heard the opinion expressed that this great quartz lode does most probably contain gold. However that may be, there is abundant evidence in the shape of ocular demonstration that they do contain very rich copper ore and silver-lead ore in no small quantities. Perhaps Capt. Price might be able to throw some light upon the subject if he so thought proper as to whether any gold has been found in the quartz in either of these mines—the Great Ashford and the Great Gias. The next mine I wish to call attention to is the Old Severn or Nant Melin Mine, about a mile and a half west of the latter mines. Many years ago the late Capt. Reynolds, of Llanidloes, but then of the Dylife Mines, had his attention called to the Severn Mine, and so impressed was he with the prospects of the lodes at the Old Severn that he immediately applied for a grant of the sett, and obtained it. Capt. Reynolds then set about clearing out the old adit, and drove the level further upon the course of the lode, and very soon cut into a splendid bunch of lead ore, and from which a very great quantity was stopped away from above the adit level, and sent to market. An engine-shaft was then sunk from the surface down to the adit, and again down to 10 fathoms below the adit. A level was driven along the course of the lode at the 10, and the result was further discoveries of lead ore. But at this point, from some untoward circumstances amongst the company, the mine stopped, as a great many other rich mines frequently do. Having remained idle for a few years a private company took it up; they put up a new water-wheel and pumps, and sunk the engine-shaft 20 fathoms deeper. This being done, and as they were just beginning to drive along the course of the lode to come into the great course of ore going down on the bottom of the 10 fm. level the principal partner died. That put a stop to the Severn again, and thus one of the best mines, according to the opinion of miners in the district has been idle ever since, save when a few miners have had permission to go and rise ore on tribute occasionally, and they have always done exceedingly well at it along the adit and in the old stopes above the adit. It is also evident from the shallow adits above and the burrows out of those that the old workers of former times must have reaped a rich harvest here. There are several other old mines in the neighbourhood that well deserve attention; but, as my letter is getting longer than I intended, I will leave them until another time, when, with your permission, I will again return to the subject. It is said—and it is a popular saying amongst Welsh miners—that Merlin prophesied that there is sufficient wealth in Plynlimmon Mountain to pay the National Debt; however, I suppose the National Debt was not quite so large in Merlin's time as it is now. One thing, however, is certain that there is immense wealth in the old mountain and the adjacent hills around it that only awaits the necessary means for its extraction to make itself felt.

Llangurig, Montgomery, April 17.

B. P. HANCOCK.

#### RHYDDU SLATE DISTRICT, C. RNARVONSHIRE.

SIR,—To a geologist slate deposits are a most interesting study, as they are amongst the oldest formations in Great Britain; so old, indeed, as to appear almost coeval with creation, the only older formation being the Laurentian, which is found in the north-west of Scotland and the Hebrides. Having heard that a valuable bed of slate had been lately discovered in the Rhyddu district, on the road from Carnarvon to Beddgelert, in the lower Silurian formation, I took the opportunity, being in the Principality last week, of paying it a visit. I remember that, some years ago, a great stir was made in Carnarvonshire by the discovery by Mr. John Francis (then manager of Lord Penrhyn's quarry) of slate rock on the farm of Cwm Trwsawl, at the head of the Pennant valley. Mr. Francis having secured the lease sold his interest in it to a company called the Prince of Wales Slate Company for, I believe, 20,000*l.* Some first-class slates were made by that company, but the great difficulty and drawback was the want of a cheap means of transit, the cartage to the shipping port (Carnarvon) costing about 13*s.* per ton. Since then, however, the district has been approached by two railways, from Carnarvon by the North Wales Narrow Gauge Railway from Portmadoc by the Gorsedda Junction and Portmadoc Railway, and now enjoys direct railway facilities, as the termini of these lines are both slate shipping ports.

It is strange at the present time with so much money seeking profitable employ that capitalists have not been attracted to the district, as large fortunes will undoubtedly be made by those who are so fortunate as to now secure the properties. Whilst the district, however, has not yet attracted outside capital, some Carnarvon gentlemen, who "are wise in their generation," have commenced quarrying operations on an extensive scale at Glanrafon, near the Snowden Ranger Inn. Over 100 men are now employed in taking off the top rock in order that it may be worked as an open quarry, similar to Lord Penrhyn's and Mr. Assheton Smith's quarries. Both the colour and the cleavage of the slates now being made are excellent, and the progress of the workings is watched with considerable interest, as it will to a great extent determine the question whether the slate rock of this district is as good in depth as at the outcrop, and, as a consequence, whether it will yield profitable results. Of this, at any rate, in the case of the Glanrafon Quarry, there seems no doubt, as before uncovering the top rock a deep trial level was driven, which proved that the slate rock was equally good at that depth. It is said that the same slate vein will be found in the Llyn Gader, Bwlchydellior, and Prince of Wales Quarries on the opposite hill side south-west of Glanrafon Quarry, the two first-named quarries are at present idle, but work is in progress at the Prince of Wales

Quarry in the western side of the vein, and some good slates are now being made, also some slabs from the eastern part of the vein. For a holiday tour no more enjoyable trip can be made than a visit to this district, starting from Carnarvon and passing near the south-western flank of Snowdon, through Beddgelert and Portmadoc, thence over the Festiniog Railway via Bettws-y-Coed to Llandudno Junction, which is on the London and North-Western main line. Those fond of walking will find a direct road from the Prince of Wales Quarry down to Portmadoc, over the Gorsedda Junction Railway. Possibly some of your readers may feel disposed to visit the locality next holiday time.—April 19.

VIATOR.

#### NORTHERN LEAD MINING COMPANY.

SIR,—A letter from a friend just received who resides in the immediate neighbourhood of these mines says that it does not seem to be known what a rich mine the Brandon Walls portion is likely to turn out even for this rich district, although the 37 and 50 fm. levels are only just started. He also says that the Stotsford portion is to be suspended for the present in order that the Brandon Walls Mine may be opened on quickly, where they have a large extent of virgin ground, that it can be worked cheaply by water-power, a splendid wheel doing all the work, and the only costs to be expended now are the expense of pushing forward the levels. To this I may add that the capital to be paid up is small, and the mine in the hands of a capital man—in fact "the right man in the right place." E. S.

#### THE KEY NOTE TO WEALTH.

SIR,—Under this heading I observe a communication from your old correspondent, Mr. T. J. Barnard, and appearing in the Journal of the 8th inst.; and to all unprejudiced minds a certain degree of pleasure must be felt that he is still the untiring energetic miner as of old. It is apparent from his own words that Mr. Barnard has deserted English mining in favour of foreign, pronouncing the former as worked out, and useless further to support. I, for one, regret this determination, and for the reason that, now that the irritation caused by the collapse of the companies so closely associated with his name has passed away, it is clearly seen that Mr. Barnard acted with the purest and most honourable motives, believing that in the success of the mines, and that alone, he would obtain his reward, and more particularly because many have petitioned him to re-visit the scene of his former triumphs and defeats, and revive the mining now at a low ebb in the neighbourhood.

On the minds of all readers of Mr. Barnard's new project must dawn the practicability and remunerative nature thereof, and I should say that it would command the best support, although I and many others would prefer that his attention could be diverted to Devon and Cornwall again as a field for operations. DEVONIAN.

April 18.

#### THE PRESENT ASPECT OF MINING.

SIR,—I noticed with satisfaction a letter signed "Crusader" in last week's Journal. I am also of his opinion, that the present system of bringing mining properties to the notice of investors is radically opposed to the successful, and by that I mean profitable, working of mines. The fault chiefly lies in the circuitous manner by which the mines are brought to the notice of the capitalist. There is generally a very good reason for this, as the discoverer, nearly always a poor man, is unable to obtain money to work and develop his property, and, therefore, has to depend on middle men, promoters, and others. I have visited and examined numerous mining districts, and in most cases I found that the mines were good, and would have paid large dividends if they had been purchased at the owners' price; but when several men have to make their per centage before letting the real investors get at them, it is not to be wondered at if the mines cannot bear the heavy strain so put upon them—in other words, their inability to pay the necessary interest on an inflated and exorbitant capitalisation. Add to this an extravagant and too often inefficient manager at the mines, together with an expensive London management, and I think it will be acknowledged that success under the above conditions is impossible. Of course, it is only right and fair that promoters and others, who run a great risk of losing their time and money, should make proportionate profits, but why should there be any middle men and promoters? The right way for private gentlemen and others who wish to invest in mining would be for them to get a competent and reliable man—one who has had experience in mining—send him out to a mining region, and let him deal direct with the prospector or owner, thus obtaining the property on the most advantageous and equitable terms. Sufficient capital should then be subscribed to properly develop and work the property, and the shareholders should appoint two or more of their number to act as a managing committee. In this way a handsome profit would be realised, the working expenses reduced to a minimum, and a comparatively small capital would suffice. My way of thinking is to fit a company to a mine, not a mine to a company, as is usually the case.—St Clements House, Clements-lane, April 19.

M. T. G.

#### Meetings of Public Companies.

##### NOBEL'S EXPLOSIVES COMPANY.

The ordinary general meeting of shareholders was held at the company's offices, Glasgow, on Friday.

Mr. A. S. SCHAW in the chair.

Mr. W. H. THOMSON (the secretary) read the notice convening the meeting, and the report of the directors, an abstract of which was published in last week's Journal.

The CHAIRMAN, in moving the adoption of the report, stated that the year's expenditure on capital account was 9605*l.* 19*s.* 4*d.* They had expended 1152*l.* at Ardeer on blasting-gelatinous works, and 1304*l.* on the introduction of water by gravitation from the Irvine Water-works—this was indispensable for the manufacture of blasting-gelatinous, and will also be useful in the production of dynamite. After referring to the other items of expenditure, he continued that in lowering the selling price of dynamite in this country they have had a double object in view—to retain their customers, and at the same time to make way for the introduction of blasting-gelatinous at a price not exceeding the rate formerly charged for dynamite. Blasting gelatinous, the shareholders are aware, is a new explosive, invented by Mr. Nobel. It is 50 per cent. stronger than the best dynamite, and is destined, the directors believe, ultimately to supersede it entirely. Wherever the blasting-gelatinous has been tried its great superiority as an explosive has been fully recognised. Meantime the demand for dynamite is daily increasing, and the sales are only limited by their ability to produce it, so that the reduction in the price has rather been one of policy than of necessity. They have resolved to duplicate their present nitro-glycerine works, and they are making a corresponding addition to their works for the production of nitric acid. When these extensions are completed they will enable them materially to add to their manufacture of dynamite and blasting-gelatinous. Referring to the accounts appended to the report, he might congratulate the meeting on the improved position of the company, as shown by the balance-sheet. The 9500*l.* paid for goodwill has now been replaced by cash from accumulated profits arising from the self-denial of the shareholders in accepting restricted dividends, and the amount is now fruitfully in their extending business. The 9500*l.* of patent rights extinguished in the same way might very well have continued in their balance-sheet as a valuable asset, for although the dynamite patent has lapsed it has been replaced by others for blasting-gelatinous, which are much more valuable, conferring as they do the exclusive right to manufacture and sell this new explosive compound, not only in the United Kingdom but in all the British colonies and dependencies, whereas the exclusive rights conferred by the dynamite patent were limited to the United Kingdom. He concluded by formally moving the reception and adoption of the report and balance-sheet: the declaration of a dividend of 36,000*l.* (15 per cent. free of income-tax) payable half on May 11 and half on Nov. 9; and that 10,000*l.* being added to reserve fund the balance of 9737*l.* 1*s.* 3*d.* be carried forward to next account.

Mr. A. H. McLEAN: I suppose if anybody were to offer you 50,000*l.* for your blasting gelatinous patent you would not sell it for that sum?—The CHAIRMAN: The subject has not been before us. Looking at the profit we have made out of the dynamite patent we have no inducement to sell it upon any such terms.

Mr. McLEAN: Well it is very modest of the company to take no credit in the balance-sheet for so valuable an asset, but we will get it, I have no doubt, in the form of dividend.

The CHAIRMAN: There is no doubt we thought it better (as we were in a business with money at our credit from the accumulated profits) to write it off, but at the same time we must express to you the very strong opinion we have of the value of the future of the gelatinous patent.—The report was then unanimously adopted.—On the motion of Mr. FORMAN, Mr. Hugh Beckett was re-elected one of the directors of the company.

On the motion of Mr. WHITE, of Overloun, the sum of 800*l.* was voted to the directors for their services during the past year.—Mr. Wm. Anderson, C.E.,







that we have driven rather a hard bargain, that we have got it too cheap, and the shareholders whom they represent would take up shares, with the hope of recouping themselves for the very low price at which they had sold.

Sir CHARLES CLIFFORD said it was originally a small company in Sydney who owned the property, and who owned a great many mining properties all combined together.

A SHAREHOLDER: May I ask if I am right in the impression that the work at the mine is now in progress, and that the proceeds of such work will accrue to the existing company?—The CHAIRMAN: Certainly, but there are only a small number of people employed merely to keep the claims going, but what ever they produce belongs to us. There was a crushing not long ago which I imagine belongs to us.—The SECRETARY: 106 ounces.

The CHAIRMAN: 400l. worth. That is since the prospectus. We have no definite information, but we gather that that is a crushing of gold that belongs to us.

A SHAREHOLDER: Am I right in my idea that at the present moment the mining property had not actually been transferred to this company?—The CHAIRMAN: No, it has not. We should have heard by telegraph of it had been. Mr. HENRY MAUDSLAY: The shareholders present will understand this, that this is a statutory meeting, in order to comply with the Act of Parliament, by which we feel our position now to be, so far as we are concerned, established here in London. We are waiting for information from the colony, which when obtained will certify to us that the mine is our own, and we shall then be in a position to carry out mining operations I hope to a successful result.

The CHAIRMAN: In the meantime, all the gold that is produced from Dec. 31 belongs to us.

A SHAREHOLDER thought that as there were so few men at work at the mine they could not expect any large dividend for the present.

The CHAIRMAN: No, Sir.

The SHAREHOLDER: You have felt it would be undesirable to establish a larger working power than is necessary just to keep the thing going until all is completed?—The CHAIRMAN: And then by improved machinery and a large number of hands employed, there ought to be very much larger returns.

Mr. HENRY MAUDSLAY proposed a vote of thanks and confidence in the directors, and he said the shareholders felt that the directors had done everything that they possibly could in the time. He thought his co-shareholders would agree with him that it was desirable at this moment to pass a vote of confidence in their Chairman and directors. Under the circumstances he thought that everything had been done that could be done, and he hoped that in a very short time they would have some satisfactory intelligence.

Capt. COFFELL thought they might add a rider, and include the secretary, who was a very good man, and also the officers of the company.

The motion, with the addition of the rider, was seconded, and carried unanimously.

The CHAIRMAN: I am sure we are all very grateful, and will continue to do our best.—The proceedings then terminated.

#### SOUTH CONDURROW MINING COMPANY.

A meeting of adventurers was held at the offices of the company, Austin Friars, on Wednesday (Mr. H. J. MARSHALL in the chair), for the purpose of passing the accounts and transacting the general business of the company.

Mr. EDWIN F. COLMER (the secretary) read the notice calling the meeting.

The CHAIRMAN said he would call attention to a slight error in the form of the notice, which stated that the meeting was held, amongst other things, for the appointment of a secretary. As a matter of fact, the appointment of Mr. Colmer to the post of secretary took place some weeks ago, and the committee merely intended to report the fact to the shareholders.

The minutes of the last meeting were then read and confirmed.

The financial statement for the 16 weeks showed a profit on the four months' working of 1684l. 1s. 10d., and that the balance now in favour of the mine was 3780l. 15s. 7d.

Capt. RICH then read his report as follows:—

April 17.—Since your last general meeting in the early part of the year we have been urging on the different points of operation in the mine vigorously. The lode in the rise above the 30, at the engine-shaft, is worth 20l. per fathom. We have begun to drive on the tin lode at the 30 ft. level, west of the cross-course, where it has a strong and kindly appearance, and we have reason to expect that it will improve as it is opened. The slope in the bottom of the 60, east of King's, is worth 12l. per fathom. The back of the 50, east of King's, is worth 12l. per fathom. The 50 end east is worth 8l. per fathom. The 60 end east is worth 12l. per fathom. This end is suspended for the time, and the men put to sink a winze in the bottom of the level for ventilation and to open ground for stopping; the lode in this winze is worth 12l. per fathom. A slope in the bottom of the 60 east is worth 10l. per fathom. The 60 end, west of Plantation shaft, is worth 7l. per fathom. We have just started to drive the 60 east of this shaft. The lode in the bottom of the 63 west is worth 10l. per fathom. The 70 east of King's, on the south part of the lode, yields stones of tin. A rise in the back of the 70, on the north part of the lode, is worth 8l. per fathom. The rise in the back of the 70, west of Plantation shaft, is up 12 fathoms. There are three slopes in the back of the 70, west of Plantation shaft on the tin lode, worth 8l., 9l., and 10l. per fathom respectively. The 80 end east of Plantation is worth 8l. per fathom. A slope in the back of this level is worth 10l. per fm. The lode in the back of the 80, east of King's, is worth 12l. per fathom. We have intersected the lode in the rise above the 93 east of King's; it is letting out water freely, and we hope it will soon drain the bottom of the 80 east. The lode in this rise carries a little tin, intermixed with native copper. Marshall's shaft is in full course of sinking, and has now reached 60 fathoms below surface. The sinking was retarded for a month or more in the beginning of the year on account of the water, but it is now quite dry, and we hope to communicate with the rise in the back of the 70 during the coming summer. When this work is accomplished, we shall have over 90 fathoms of high ground on lode standing before us westward to operate on, and independent of the flat lode. The lode in the bottom of Marshall's is worth 10l. per fathom for the length carried (9 ft.). The 50 end east is worth 7l. per fathom. The 50 west is worth 7l. per fathom, but looking at the level above, we expect an improvement very shortly. The lode in the 40 end west has a strong and kindly appearance, and is worth 10l. per fathom. This end is suspended for the time, as we are afraid that we may drain water into the shaft and thereby hinder its sinking. The slope in the back of the 40 west is worth 10l. per fathom, and the slope in the 40 east is worth 8l. per fathom. We have a winze sunk in the 4. east some 10 fathoms in a strong and moderately productive lode. The 50 end east will soon be communicated with this winze and give good ventilation and open ground for stopping. We have begun to drive the 30 west of Marshall's, where the lode is improving and is yielding good stones of tin. We have recently had to make extensive repairs to the stamps and to the engine connected therewith, and have had to replace a worn out boiler. We have put in the new boiler, which is giving satisfaction. The whole of these extras have been charged and paid with the current cost of the mine.—W. RICH, W. WILLIAMS, HUMPHREY KING.

Mr. MACKAY said all the ends seemed more or less productive.—Capt. RICH: I have seen them better, but we are opening up a new mine to the west.

Mr. MACKAY: It is a good thing to see that you are paying as you go along, making a new mine, and also paying dividends. (Hear, hear.)

The CHAIRMAN said—Since we last met our sales of tin have been at about the rate which we were then making—something like between 30 to 32 tons of tin per month. The price kept up pretty well to within last month, during which time it has dropped rather considerably, and during the last week in a manner which can only be described as perfectly horrible. The profit, as you have heard, which has been made during the 16 weeks amounted to 1684l. 1s. 10d. That profit has been made in the face of a considerable expenditure upon what some might call the Limited Liability System, would charge to capital account. In fact, a friend of mine sent me a record of the meeting of a mine in which he was interested, the other day, where a call was made to meet expenditure upon new ground, and at the same time a dividend was declared, and everything was very pleasant indeed. If we could only charge, or if it was our custom to charge, to capital account, our expenditure upon what are called exploratory levels, and dead work we might have sent you a better account, but we do not consider it advisable so to do. That is not the custom, as you know, upon which Cost-book mines are worked, and, therefore, we must be satisfied with a smaller dividend and the absence of a call. I think Capt. RICH will bear me out (from what I understood from him this morning, in saying that he expects his expenses will now be rather less than they have been). The machinery is now bought and paid for working a part of the new mine we are opening, and I think he anticipates before the next meeting we will have the shaft called Marshall's put through, which will enable us to work the new ground freely and without stint. At present he is afraid to work too much there for fear of having more water, and being drowned out. If we can work there more freely and have good water, as we hope it will, we hope to be able to return some tin—at any rate, we should have the chance of doing so. Since the last meeting we have had the misfortune to lose an old and valued servant, our secretary, Mr. Hickey, whom you all remember very well, and as it was absolutely necessary to appoint a successor, we thought it would meet with your approval if we appointed Mr. Colmer, who has served in the office for fourteen years, and therefore had every opportunity of being thoroughly conversant with the business of the mine, and therefore we have appointed Mr. Colmer secretary, and I have no doubt he will give us every satisfaction, and I hope it will meet with your approval. (Hear, hear.) The amount of profit will enable us to declare a dividend of 5s. per share and 154l. to the floating balance, and we beg to recommend such a dividend. To put myself in order I will first move that the accounts which you have heard read, and also the report, be received and adopted.—Mr. COULLEN seconded the motion, which was put and carried.

On the motion of the CHAIRMAN, seconded by Mr. CLARKE, a dividend of 5s. per share was declared.

Mr. SLACK said he should like some explanation as to why it was necessary to accumulate a reserve fund, and whether it was necessary to go on increasing it. He also hoped the utmost economy would be practised.

The CHAIRMAN: The question of reserve fund directly bears upon the resolution now before the meeting as to dividend. Will you propose an amendment?

Mr. SLACK: No; I would not do that.

Mr. LEACH said that having been a large shareholder for some years, and being the oldest shareholder in the room, he might mention that some time ago it was thought a floating balance should be retained, as otherwise the balance would have been passed into the pockets of the shareholders long ago; but the committee thought it better to pay the merchants' bills and take a discount. During the past four months the discount on merchants' bills amounted together to 54l., which came into the shareholders' pockets; and if they multiplied that by 3½ times it would make just 193l. discount in the course of the year. (Hear.)

The CHAIRMAN said the question of the reserve fund had before been very fully discussed at these meetings, but he would again gladly give the reasons why the committee thought it advisable to keep a good reserve fund. From the very nature of the business there were considerable sums of money owing to the company; at the present moment there was about 3200l. owing to it (that is to say, in bills maturing), and if there was no balance the directors would have to borrow from the bankers to pay dividends, in addition to having to discount

their bills. With respect to the figures which the reserve fund should reach, in rough figures when the committee settled to begin accumulating that balance they settled upon the figure of 2000l., but it was found that 2000l. was practically insufficient, and the committee would like to make it between 2500l. and 3000l. The committee never set before themselves the intention of making it and keeping it at any fixed figure, but they intended to draw money as convenient, either (say) for the purpose of equalising dividends or meeting any unusual expenditure that might arise. As a fact, that balance had been drawn upon two or three times, and would be again when convenient. After the payment of the dividend they would carry forward a balance of 2278l., which was made up of the balance brought in, with 154l. added thereto during the present 16 weeks.

A SHAREHOLDER said he thought the report was very satisfactory. Mr. LEACH said the Chairman was a very large shareholder, and the other members of the committee had also large interests, so the shareholders might rest satisfied that everything possible would be done to protect their interests.

Capt. RICH said he looked upon the reserve fund from a miner's point of view. He had contended that the true principle of a Cost-book mine was to divide profits when they were made, and divide losses as they were made. But he must say he thought the Chairman had got the best of it, because the reserve fund had been very handy, for they had had to pay for stamps and for other extra work, and therefore he thought the Chairman was right in the view he had taken regarding the reserve fund. In the new concern they could not shut their eyes to the fact that there would be considerable expenses incurred, and therefore, it was good policy to increase the reserve fund. They commenced the new portion of the mine in January of last year, and in 13 months the shaft would be 100 fms. If they could put it down by next meeting, and he hoped they would accomplish that object. There was the double skip-road, which was complete. If they got it through by next meeting they would not do badly, with pit-work fixed. In addition to the new mine there was a great mine to be kept on as well, and they had to sell the tin to keep on the stamps. The south lode was a new lode altogether, and independent of the flat lode, but would probably drop into the flat lode in depth. It was now worth about 10l. or 12l. per fathom.

The CHAIRMAN said he had just received from a firm in Cornwall a telegram regarding the price of tin, who said that the present state of the market was very critical, and they could give no price, but hoped that a reaction would set in in the London market and prevent a further drop, but if there was not that reaction a further drop was inevitable.

On the motion of Mr. MACKAY, seconded by Mr. SHEARWOOD, the committee of management were re-elected, and a vote of thanks having been passed to the Chairman and directors the meeting broke up.

#### MELLANEAR COPPER MINE COMPANY.

The ordinary general meeting of shareholders was held at the company's offices, Queen-street Place, on Thursday,

Mr. R. HENTY in the chair.

Mr. W. G. WILLIAMS (the secretary) read the notice convening the meeting, and the report of the directors and statement of accounts were submitted:—

The accounts show that the profit for the year ended Dec. 31 amounted to 4532l. 12s. 8d. This is about 1300l. less than it was for the preceding year, a result which may be said to be entirely due to the lower prices realised for the ores, as the total quantity was within 32 tons of the returns for 1880. The subjoined figures give a comparison of the two years:—During 1880 the sales were 6326 tons 9 cwt. 2 qrs., realising 23,039l. 11s. 5d., or an average of 3l. 7s. 6d. per ton. During 1881 the sales were 6794 tons 9 cwt., realising 21,639l. 5s., or an average of 3l. 3s. 8d. per ton; showing decrease 32l. 1s. 2d., and 1400l. 6s. 5d., or 36l. 1d. in the average price per ton. In addition to the above a sum of 526l. 10s. 3d. was realised for tinstuff last year.

After paying dividends quarterly last year as usual, the balance at the credit of profit and loss account on December 31 was 2006l. 6s. 8d. Out of this amount a dividend of 2s. per share, or 1000l., was paid Feb. 7, and 454l. has been added to the reserve fund, leaving a balance of 5522l. 6s. 8d. carried forward. The reserve fund now amounts to 2078l. The amount disbursed on plant account, and charged against capital last year, was 438l. 0s. 9d., and included outlay on new dressing floors, and the cost of a boiler and fittings. Capt. Gilbert's usual annual report gives full details in regard to the mines and works. Whilst the reserves of ore have been slightly reduced, they are still estimated at the very satisfactory quantity of about 15,000 tons.

The CHAIRMAN said: Gentlemen, I have very few remarks to make in addition to what you have already seen in the printed reports. The directors have just declared a dividend of 2s. for the quarter, which is similar to what we have had for the last three quarters, and considering the state of the copper market, and the depressed condition of trade, we think this will be considered satisfactory by those who are interested in this company. We have paid an average of 22 cent. upon the last year, which is a good deal better than a good many of our neighbours engaged in similar undertakings have accomplished. In addition to the dividends which have been declared during the past six years we have put by 2078l. to the reserve fund, and we propose to put a further 100l. by from the present profits. We have also written off from the outlay on the mine 1885l.; so, considering all things, I think the shareholders cannot be otherwise than satisfied with the result, and I think they will also be satisfied that the directors have used a reasonable amount of prudence in not dividing all the amount of money which has come into our hands. (Hear, hear.) The returns have been 6794 tons, which is within a trifle of what was produced in former years, and the reserves remain nearly the same, and are only reduced in some very slight degree. The price of copper has been so ruinously low that it has affected us seriously. For the same amount of raisings in the present year, if we had only had the price of the previous year, it would have made a difference of 1300l. to our profits. We have nothing to complain of in the amount of produce, but the general state of the trade, and the depression in the metal market particularly, is alone responsible for your not having a better dividend. I do not know that there is anything with regard to the price which looks more cheerful at the present moment, and I am afraid there are no grounds for flattering your hopes in that respect. Including the dividend which is now about to be paid, we have returned 17,000l. upon the original 20,000l., and I think that must be considered satisfactory to those who are interested. The amount of copper which has been raised has been 29,300 tons, and the amount received in actual cash has been 98,000l., which has been returned from the time that we have been engaged in it.

Mr. MATTHEW WILLIAMS asked whether the 2000l. on deposit was apart from the reserve fund?—The CHAIRMAN said it was. It was a portion of the original capital which was not required, and had been kept on deposit.

Mr. WILLIAMS said he thought it would look better if it were stated in the report that this was quarterly dividend.

The CHAIRMAN said he saw no objection to stating in future reports that the dividend was for the quarter. He went on to say that Mr. Richard Taylor, who was at present in Cornwall, had written to say that he had just visited the mine, and that everything was going on perfectly satisfactorily.

Mr. KINGFORD said he noticed that small quantities of tin were being met with. The CHAIRMAN said that was so. Small lumps of tin were being met with at times, and it was going on even to quite recently, but it was always a precarious return.

Mr. JOHN TAYLOR said the subject was drawn attention to in Captain Gilbert's report, who said—"It is very encouraging to have such a large and promising lode in the bottom of the mine, and when the levels are a little further advanced we shall again cut into the south part of the lode to ascertain its value for tin." This was a point of great interest, and there was a hope of getting into a lode containing a larger proportion of tin. During the past 12 months the tin sold realised upwards of 5000l. This was very encouraging, and without leading them to think they were going to have a second Dolcoath it was a matter of some importance.

The report and accounts were then adopted. The retiring directors, Mr. John Taylor (who has been elected on the board in the place of his late father, Mr. Richard Taylor) and Mr. John Wild, were then re-elected, on the motion of the CHAIRMAN, seconded by Mr. KINGFORD.

Mr. JOHN WILD, in acknowledging his re-election, said it was very gratifying to be connected with a mine which had been so successful ever since it had come under the management of the Messrs. Taylor. Before that it was anything but a success, and since it has been in Messrs. Taylor's hands it has only had the best of the original lode, which was best, but they had also a great chance of getting one north and south, and finding the ore extending in breadth.

On the motion of Mr. OAKES, the auditor, Mr. Charles Hurlbatt, was re-appointed, and the meeting broke up after passing a vote of thanks to the Chairman.

#### OLD SHEPHERDS MINING COMPANY.

##### STARTING THE FIRST ENGINE.

The 80-in. engine on this mine was very successfully started on Saturday last. The engine was manufactured at Messrs. West and Son's Foundry, St. Blazey, and the engineers are Messrs. Loom and Son. There has been a great deal of work effected on this mine since a fair start was made. In the south part of the mine the adit has been cleared 800 to 1000 fms. in length, and in the latter part of the distance the adit was quite choked. The shaft on which the engine-house is erected has been cleared to the adit level, and pit-work fixed to the depth of nearly 30 fms. A shaft has been sunk in the western ground and an engine erected on it, two lodes have been cut in the 16 ft. level, and lead is being dressed for market. This ground gives high promise of great richness when further depth is attained. The north lode is producing good work for lead and in paying quantities; and the south lode is being driven, and it is expected that equal riches will be found here shortly. Green's patent dressing machinery is already fixed, and when the mine is drained it will be at full work immediately; and with this powerful engine, which it is calculated will raise 900 gallons of water per minute, it will not take long to get the water out.

Mr. F. TAMBLYN, one of the directors, officially started the engine, and in addressing the miners and others outside the engine-house he said they were not there that day to start the engine on this grand Old Shepherds Mine, after a lapse of 50 years or more, since the last stroke of an engine was given there, not through any want of ore—for they were all aware that there were five times more ore there than had been taken away, although profits amounting to nearly a quarter of a million had been made—but through a dispute as to the ownership of the minerals. He was about to call on the engineers to start the 80-in. engine, and he hoped and believed Old Shepherds would prove as productive in the future as it had done in the past. (Cheers.)

The engine was then started, with the assistance of the engineer, and it worked most satisfactorily for a short time, and every stroke brought up a great volume of water from below. When the engine was stopped three hearty cheers were given.

Mr. HENRY BROWNE, the purser, addressed the miners. He remarked that they had just witnessed the starting of one of the finest engines in the district. It had gone to work well, and he thought every man employed there had done his best to bring that to pass. (Applause.) That was only the beginning of great and lasting work. They had in Old Shepherds one of the best lead mines in the district. (Applause.) They knew what it was from past knowledge, and he thought everyone of them would verify everything he had said respecting its riches. His grandfather was manager of that mine 60 or 70 years ago, and his opinion was that Old Shepherds would last for ever. His father had about 40 years ago endeavoured to take up the sett, and he cleared the adit level for nearly 400 fms. in length, but, unfortunately, through a little quarrel the sett could not be obtained. But, fortunately, they had the sett that day, and what their forefathers commenced they would carry out, and he hoped they would all do their best for the company. So long as the miners did their duty they would have good wages, and as time went on, and the mine paid dividends they would have increased wages. (Applause.) He could then put their whole energy into the work, and if they did he was sure they would have one of the grandest mines in the district. (Cheers.) Three cheers were then given for the directors and shareholders, and the ceremony of starting the engine was concluded.

The company adjourned to the East Wheal Rose account-house, where they were provided with a dinner, the room in the Old Shepherds account-house not being sufficiently large for the party. Mr. F. TAMBLYN presided, and there were also present Messrs. G. Forman (a director), Matthew Loom, Michael Loom, W. Trethway (Gramppond), W. West (St. Blazey), N. West (Harvey and Co., Hayley), B. J. Frecheville (M. Inspector of Mines), J. Sell (London), J. Oxburn, J. T. Browne (London), Henry Browne (St. Austell), A. Luke (St. Austell), T. B. Lake (St. Austell), W. J. Adams (St. Austell), R. H. Manhire, F. Dingley (Truro), R. Salmon, Capt. R. and J. Nancarrow (Old Shepherds), Capt. J. Dodge (East Wheal Rose), Capt. Hooper (St. Dennis), and Capt. T. Job (St. Dennis).—Capt. Josiah Thomas, of Dolcoath, the representative of the Ecclesiastical Commissioners, wrote expressing regret at his inability to be present.

After doing justice to an excellent dinner, the usual loyal toasts were proposed, after which

The CHAIRMAN proposed the toast of the day, "Success to Old Shepherds Mine." This, he felt, was a most important meeting to celebrate a most important step in the history of these mines. (Applause.) And no one present would gainsay that Old Shepherds was one of the most important mines in the district—(applause)—if he were not in East Wheal Rose account-house he would say the most important. They were there to inaugurate in that district what had been from various causes hindered in past years, and in Old Shepherds especially it was impossible that any undertaking of the kind could be carried out, or that any work could be done. It was forcibly kept idle from certain causes. Everyone present knew that it was from a lawsuit which had been fairly fought out between the land lords, and now the present company had full possession of the property. (Applause.) They had been waiting for the 80-in. engine to be put in, and in the course of a few weeks, or as soon as possible, they hoped to resume the taking away of the riches now to exist there—work which was abruptly stopped 50 years ago in consequence of the lawsuit. This mine was not like a mine that had been worked out and abandoned. It had been worked it was true, and had profits made; but as far as he understood, and he had full particulars, it was worked on the north lode 70 or 80 fms., and a great deal of that had been left standing, and the ore was very rich silver-lead. To the south the mine had been worked 120 fathoms, and from the information he had been able to gain these lodes had only been worked a few days for about one-sixth of their length. They had been left standing in the whole run of the mine, and he could not but say that day, and saw from one end to the other, something like a mile and a quarter in length. (Applause.) He believed there were four or five lodes—(Mr. J. Browne: Five)—and besides that they had the western ground, which was in addition to the ground held by the previous company, and from which ore was now being broken and sold. They had, he considered, in Old Shepherds three mines, either one of which, usually speaking, would be large enough for any one company. The three formed what he considered one of the best, and must be from all previous experience, one of the great mines in Cornwall. (Applause.) He was very pleased, indeed, to have the honour of being connected with Old Shepherds, because it was situated in the neighbourhood where he was born, and although it was stopped long before he came into existence, yet there was a sort of tradition attached to the mine which he remembered, and that it was as if it could be got out of the law courts a certain fortune to whoever worked it. (Applause.) He had heard that in every direction, and he was very glad indeed to find that he was not alone in that opinion amongst Cornishmen. Cornishmen he had found had been rather chary of investing in Limited Liability mines, principally, he thought, from want of knowledge of the Limited Liability principle, it only now being properly introduced in Cornwall, but Old Shepherds seemed to be so *bona fide*, so thoroughly believed in, that he was pleased to see that over 10,000 shares in Old Shepherds were held in Cornwall. (Applause.) Not only are these shares held in Cornwall to this extent, but he believed the Cornish shareholders had paid their calls up nobly and well. This, he thought, was a true sign that Cornishmen believed in Old Shepherds, and if Cornishmen believed in Old Shepherds shareholders out of the county were all right, because Cornishmen knew mining if anybody did. He could not bring his remarks to a close without speaking of their well known and much esteemed manager, Capt. Nancarrow.—(Applause.)—He would like to couple with this toast, they well knew Capt. Nancarrow, and what he had done for himself and those whom he had previously served; he had built up fame and renown at West Cliverton, and they knew what had become of West Cliverton since he left. In Capt. Nancarrow he believed they had, he was about to say, the best lead miner in Cornwall, but he would not say that, because there were other good lead miners in the room, and he believed the spirit of emulation was always good. He was certain that they had in Capt. Nancarrow one of the best managers that they could possibly have selected. (Applause.) He should like also to say that the directors hoped and believed that the shareholders, those in Cornwall especially, would think that they had done their best, as they had always striven to do. His colleagues told him before they felt the full responsibility of the gigantic undertaking there, and they believed that at the annual meeting, which would be held shortly, they would be able to show that everything had been done in the most economical and masterly manner. (Applause.)

Captain NANCARROW, in reply, said it was a pleasure to him to be associated with the present company and the mine. With the chairman, he considered the meeting a rather important one. It was an event that had been looked forward to for over forty years, the starting and working of the Shepherds Mine. The powerful engine they had erected and started would, he believed, be quite ample to prosecute the mine to any reasonable depth. He felt that they were in a very good position as far as machinery was concerned. He well remembered the rich lodes that were being worked upon in the mine when he was a boy, and he thought it was a sufficient guarantee to the shareholders to know that lead ore was then selling at 7l. per ton, and that now it would fetch 14l. If the mine paid costs then they might reasonably suppose that the success would be good in the future. The lodes had been wrought out, but when he thought of the unwrought ground standing something like a mile in length, and that they had a piece of ground that had been applied for by scores, he could congratulate the shareholders on having the possession of the property, and he believed their success would be very great. (Applause.) An important feature was the ground left by the old workers that would not pay them for raising when lead was about 6l. or 7l. a ton. It was reasonable to suppose that there was a great deal left. There was never a crusher in the mine for returning the lead, and a great deal of the lead, being hard, was left to stand. He thought these things went to prove that their prospects were very good. (Applause.)

Mr. MATTHEW LOAM, responding for "The Engineers," said the 80-in. engine that day had had a most successful start. For the last day or two he felt that the task put upon him to get the engine ready to start that day was almost impossible to accomplish, but they determined to do so, and had succeeded. (Applause.) He was proud of the start that day, because the mine had an old historical name, and he congratulated the shareholders on having such a mine. At the bottom of Harvey's adit he believed they would have a course of ore yielding 4 tons of ore to the fathom. (Applause.) They could rely on that information, for he had it of men of repute—the former manager and resident of the mine. He trusted that the future working of the engine and the development of the mine would go hand-in-hand, and he could assure them that if the mine was as good as the engine they had a first-class property. (Applause.)

The CHAIRMAN then gave "The Merchants," and Mr. W. WEST, in responding, said it was a great pleasure to him to see such an engine started for the first time on such a satisfactory manner. It was such a start as one very rarely saw. (Applause.)

Mr. N. WEST, partner in the firm of Harvey and Co., Hayley, thought Mr. W. West was very lucky indeed in having the honour of supplying an engine to such an historical mine as that. He believed it was one of the best pieces of lead ground that Cornwall could produce, and he believed the time was not far distant when the mine would be equally as famous as it had been in the past. He believed that the future of Old Shepherds, under the present management, would be of a character that would be highly pleasing to the shareholders, and a credit to the county at large. As Cornishmen, they were proud of belonging to a county comprising such vast mineral wealth, but he thought lead ought to be added to what, to a certain extent, was the county motto, "Fish, tin, and copper." (Applause.) The gentlemen who had been instrumental in forming Old Shepherds and other companies in the county had been the means of bringing a large amount of capital into Cornwall, and as science and machinery were coming to the aid of Cornish mining, they might expect to see better profits and many more mines started in the future. (Applause.)

Mr. W. TRETHWAY responded for "The Lords of the mine." He represented Mr. Hawkins, who owned the north part of the mine. It was quite true, as had been remarked, that had the ground been free he believed the mine would not have been left until the present time to be re-suscitated. The applications for the ground had been numerous. He had always heard since a boy Old Shepherds spoken of as a gem when it was worked 50 or 60 years ago. The late Sir Richard Hawkins not only worked the mine himself but had a smelting-house, and their handsome account-house was built as the residence of the manager before the smelting works, Mr. Giddy. He thought there was a bright future before them from all he had heard from Capt. Champion and Capt. Middleton, and from his father. He believed there was very prospect of a considerable quantity of mineral below. He wished them every success. It was a great advantage to the county to see persons introducing capital into it. (Applause.)

Mr. FRECHEVILLE, in responding to the toast of his health as her Majesty's Inspector of Mines, said he had always heard that at Old Shepherds they had the most valuable piece of property, and one that would amply pay the company for the expense they went to in starting it. They had a good class of minerals, perhaps not better in the world, and it was pretty certain they had greatly to the health of the shareholders. (Applause.) Since he had been in Cornwall he had found that Cornish mining was not near so dangerous as some people would have them suppose. During the past year there were between 15,000 and 19,000 miners at work underground and at surface in the county, and there had been only 19 fatal accidents, or less than 1½ man per thousand employed. That, he thought, was very small considering the hazardous nature of the employment. (Applause.)

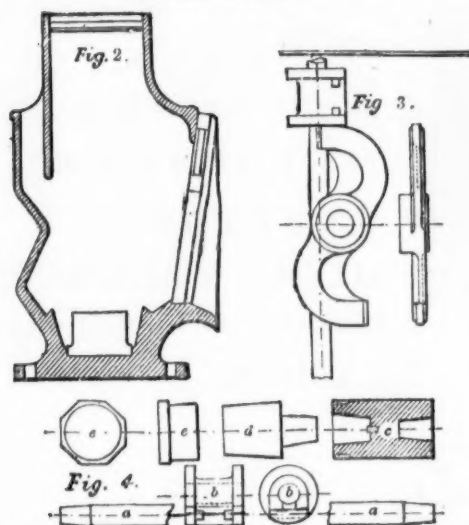
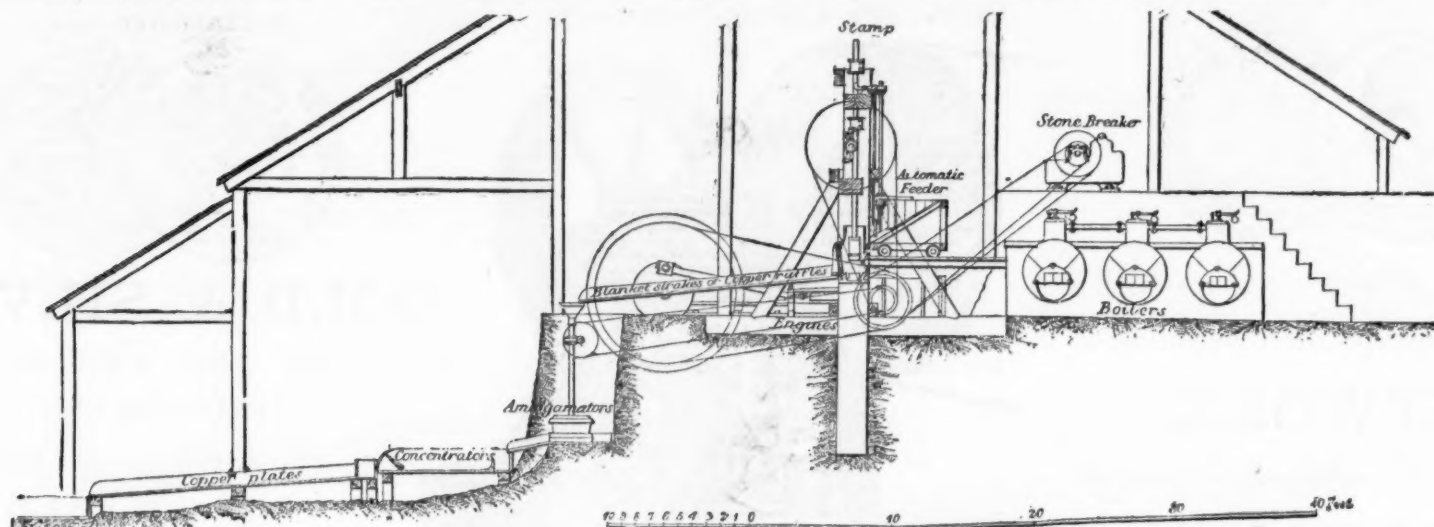
The CHAIRMAN next gave "The health of the purser" (Mr. Henry Browne). (Applause.) Mr. Browne was not a purser in the ordinary acceptance of the term, but he worked for the company every day, and was most assiduous in attending to his duties. (Applause.) He bought the materials very cheaply, and was most popular with the directors as well as with other people. (Applause.)



**HOLLOWAY'S OINTMENT AND PILLS.**—As the seasons change the climatic variations warn us all to be careful. Most especially is it incumbent on the aged prone to bronchial attacks, outward ulcerations, and similar debilitating disorders, to have them removed, or worse consequences will follow. These remedies are their sheet anchors; on their powers all may confidently rely. The ointment not simply puts their sores out of sight, but extirpates the source of mischief, extracts the corroding poison, and stimulates Nature to fill up the ulcer with sound, healthy granulations that will abide through life. Under this treatment the legs soon become sound, supple, and free from their sores, and scrofulous sores cease to annoy. Such hope for the diseased was unknown in former days.



## EXTRACTION OF GOLD FROM ITS ORES—COMPLETE REDUCING MACHINERY.



EXTRACTION OF GOLD FROM ITS ORES—COMPLETE REDUCING MACHINERY.

It being now an acknowledged fact that the success or failure of gold mining enterprise is in a great measure dependent upon the amount of judgment and mechanical skill brought to bear upon it, records of the arrangements followed in actual practice are of paramount importance to shareholders as well as to mining engineers. The above diagrams represent some gold-reducing machinery constructed by Messrs. Thomas B. Jordan and Son, of Gracechurch-street, Fig. 1 showing the general arrangement of a gold-reducing mill, while the remaining illustrations represent details to which we shall refer in due course. When the stamping mill is of the most approved type (in the present case it was made with 10 stamps-heads) mounted in wooden framing such as is generally adopted in California, it is specially suitable for localities where timber is abundant for first erection and subsequent repairs. Indeed, by many engineers timber framing is preferred to iron on account of its greater elasticity and immunity from possible fracture. This style of mounting also admits of ready repair by an ordinary carpenter. Similar stamps may, however, be mounted with metal framing, the side struts being of cast-iron and the main supports of wrought-iron, firmly bolted together as shown; this makes an exceedingly rigid and strong frame, while the weight is reduced to a minimum. These stamps are illustrated as being worked by a turbine, the motion being transmitted by gearing, each set of five heads being an independent machine.

A section of the mortar-box used for wet crushing is shown in Fig. 2; this box being of solid cast-iron of a homogeneous mixture. It weighs from 30 cwt. to 40 cwt., according to the weight of the lifts intended to work in it, and it is constructed to receive five heads. On each side of the anvils or dies are seatings extending the whole length of the mortar to receive amalgamated copper plates for the purpose of arresting as much gold as possible at this stage. It will be seen from the section that the sides of this mortar are so formed, and of sufficient height, to prevent any loss or inconvenience from splashing; for some of the harder kinds of quartz the inner sides of these mortar boxes are lined with steel plates at the points of wear; these plates are renewable and protect the casting. Under conditions of difficult transit the makers construct their mortars in sections, the lower portion or bed being in two parts of cast-iron firmly bolted together, side play being prevented by a bar of wrought-iron fitted and securely fastened into a groove underneath and at right angles to the joint, the bolts being turned to fit the bolt holes; the upper part of this sectional mortar box is constructed of steel-plates and wrought-iron top, securely fastened at the corners by strong angle-iron. It should be remarked, however, that solid boxes are for obvious reasons far preferable when circumstances will admit of their use, greater simplicity and durability being strong recommendations when the average conditions of gold mining are considered.

The stem of the stamps (see *a a*, Fig. 4) are 3½ in. in diameter of solid wrought-iron turned from end to end and polished to gauge, both ends being coned to receive the stamp-head (*c*), which is of solid cast-iron, turned, bored, and fitted to gauge, a wrought-iron ring being shrunk on its lower end to resist the wedging action of the shoe (*d*). This shoe, together with the die or anvil (*e e*), is made either of cast crucible steel, or of a special mixture of hard cast-iron; the latter is found to wear as long as steel, and is slightly cheaper for renewals. The tappets, *b b*, Fig. 4, are of hard cast-iron, securely fastened to the stems by steel gibs and cotters; this mode of fixing admits of easy adjustment, while the tappet is not liable to shift its position on the stem. This form of tappet has entirely taken the place of the old-fashioned screw adjustment, which has a great tendency to get out of order, and when worn involves extensive repairs or entire renewal.

The cams (see Fig. 3) are of hard cast-iron or steel, the bosses being strengthened by shrinking on a wrought-iron ring; each cam is bored to fit the cam shaft, which is 5 in. in diameter, turned and polished to gauge, and of the best scrap-iron, supported by three pedestals (for every set of 10 heads), these pedestals being fitted with massive brass bottom steps. The cam shaft is driven from a line shaft by one pulley for each set of five or ten heads, this pulley being 6½ ft. in diameter and 12 in. face. All details are turned, bored, and fitted to gauge, and are interchangeable, no delay is, therefore, occasioned when putting in renewals. The weight of lift and amount of fall of the stamp-heads varies with the work required to be done, those illustrated having a fall of 10 in. to 12 in., each 1½ ft. weighing 7 cwt. Each head of stamp takes from 1½ to 1½ horse-power to drive it, depending on the means used for transmitting the

power, whether gearing or belting; the average produce per head is from 2 to 2½ tons per day of 24 hours of hard quartz through a fine mesh. The screens or discharge gratings extend the whole length of the box in one piece, so as to obtain the greatest possible discharge area. The mesh and material of which they are made varies according to the description of quartz to be treated. Steel, copper, or Russian iron plates are suitable for meshes from 80 to 300 holes to the square inch, and especially for dry crushing when extra strong gratings are requisite. Strong steel wire cloth or gauze, however, has the advantage of presenting a far greater discharge surface than is possible with plates, whether punched with holes or slots, and, consequently, this form of screen allows the stamps to do much better duty, the rate at which good stamps are capable of reducing the quartz being always greater than the possible rate of discharge; it may be remarked, however, that a stamping mill of the construction illustrated has, with fine steel wire gratings, reached a maximum of 3 tons of hard quartz per head per 24 hours, the rate of working being 75 to 80 blows per minute.

To explain the method in which the machinery is used Fig. 1 may again be referred to. The rock is prepared for the stamps by the stonebreaker by which the rock should be reduced to about ½ in. cube; a 12 in. by 9 in. breaker is capable of crushing sufficient ore to feed 30 to 40 heads of stamps, and should be fed at a suitable rate for the number of heads employed. The quartz passes direct from the breaker into the automatic feeder, and thence into the stamp boxes. From the stamps the crushed ore is carried by a suitable stream of water over inclined strakes covered with blankets or copper plates, as the nature of the ore may require, and here certain proportions of the rich particles are arrested, the auriferous sand passing on into the hydraulic amalgamators, where it meets with a further supply of water, made to whirl round the inside of the hopper, and thus avoid all possibility of lodgment; it then passes down the stand-pipe, into the amalgamating pan, which is formed of two parts, the outer one being a pan of cast-iron containing about 3 cwt. of mercury, and the inner pan or muller, which is fixed to the stand-pipe, revolving slowly in the mercury. The bottom of this inner pan or muller is immersed in the mercury about an inch below its surface; the sand and water pass down the stand-pipe under pressure of the column, and are forced between the bottom surface of the muller and the mercury, the particles of the sand are by the revolving motion kept in rolling contact with the mercury, so that no particle of the whole mass which is thus spread out in a thin layer can avoid being thoroughly incorporated with the amalgamating agent during its passage under the radius of the muller, and from the particles being thus separated and brought into individual contact, the great affinity between gold and mercury at once detains the gold, while the non-metallic portions of the sand pass on with the water, and are discharged over the top of the pan.

If the material under treatment is a simple combination of gold and quartz the whole process of separation will be completed at this point, but when associated with iron, sulphur, arsenic, lead, or other minerals—which act on the mercury and tend to interfere with its affinity for gold—portions of mercury will pass into a finely divided or sickened condition, floating away on the surface of the water and generally carrying gold; this rich combination is partly arrested by copper riffles, over which it flows to the concentrators (Fig. 1), where it is effectually separated from the sand which flows with it from the amalgamators, the sand passing to ordinary buddles or catch-pits. The engines employed by Messrs. Jordan and Son for driving the machinery described above are of the horizontal non-condensing type, and of substantial and simple construction. They are fitted with Wery's patent slides adjustable by hand or automatically controlled by the governor. To meet difficulties of transport these engines are, when required, constructed in sections not weighing more than from 6 cwt. to 8 cwt.; but where the carriage presents no special difficulties, solid details are recommended in preference. Messrs. Jordan and Son have already supplied many mills, which are at present working satisfactorily.

**ECONOMY OF FUEL—IMPROVED BOILER SETTING.**—At the Naval Exhibition now open at the Agricultural Hall, Livet and Company (Limited), of Short-street, Finsbury, show models of boiler and furnace improvements, invented and patented by Mr. FOUNTAIN LIVET, which are well worthy of careful examination. The increased economy is secured by vastly improved combustion and the utilisation of all the heat obtained. In the case of marine boilers this result is secured by deep duplex fire-bars fitted in a specially proportioned furnace, combined with Wery's patent funnel, which without mechanism and by the action of air alone imparts a rotatory motion to the gases, and combines them more thoroughly in the furnace. All existing marine boilers can be thus fitted, but in new ones Mr. Livet also makes the tubes diminishing in sectional area as they rise, so that the steam escapes more freely and priming is obviated. In land boilers the same effect is produced by special fire-bars and furnace as before, with greatly expanded flues, which prolong the circulation of heat around the boiler. It must be borne in mind that apart from the merits of the individual parts of the system—which alone is very great—they must be scientifically proportioned by the patentee to suit the circumstances of the case. No two cases are alike, and Mr. Livet's wide experience in boilers and knowledge of the properties of heat are to a great extent the secret of the success of the system. Wery's funnel is specially applicable to vertical boilers in combination with Mr. Livet's fire-bars; all results hitherto obtained show a saving of more than one-third. The advantages claimed for the arrangements generally are—a strong and steady draught of hot air, ensuring more complete combustion and great saving in fuel; greatly increased power, by means of the comparative dryness and elasticity of steam; steady maintenance of pressure, and greatly diminished loss of heat by radiation. To steam-users not working at night the system will prove invaluable, as steam is maintained at 50 lbs. pressure for quite 12 hours or more without banking-up, thus saving daily both fuel and labour in getting up steam. It is further observed that priming is practically unknown with this system, high shafts are rendered quite unnecessary, smoke nuisance is abated (for this the Silver Medal was awarded at the late Exhibition at Kensington), and any description of fuel can be effectually burned. Slack and small bituminous coal is readily burned with a me-

chanical stoker in combination with Livet's patent setting—a fact of the highest importance to all large steam users, as such coal is burned at the rate of 8 cwt. per hour in a Lancashire boiler with 3-ft. tubes with great economy and without smoke, though the height of stack need not exceed 60 ft. Among the other advantages are—reduction of clinkers and ashes and of the labour of stoking; considerable reduction of temperature in stoke holes, which is of great importance in marine boilers; great durability of fire-bars; ready access to flues for inspection, owing to their large sectional area; and facility of adaptation to existing boilers. The invention is equally applicable to land boilers, and it appears that Livet and Company (Limited) is prepared to guarantee, in the case of land and marine boilers set and adapted under their supervision, a minimum saving of 15 per cent., and in the case of vertical boilers a minimum saving of 25 per cent., but the saving, it is added, will probably exceed the guaranteed minimum, increasing it in most cases to 25 and 35 per cent. respectively. Existing boilers of any type can be re-set, so as to embody Mr. Livet's improvements. If the above account is correct, and it is guaranteed to be so by the company, and vouched for by a long list of steam users, the inventions described may claim an important rank.

## FOREIGN MINING AND METALLURGY.

There is little news to communicate with respect to the Belgian coal trade. The deliveries of industrial qualities continue considerable; but, notwithstanding this, some quantities are going into stock. Prices are fairly maintained, and are still from 5d. to 10d. per ton higher than they were in April, 1881. Some contracts which have been in course of negotiation for some weeks are stated to have been now finally carried through. This is regarded as a good augury for the future. Quotations for coal have experienced little change upon the Belgian markets. The condition of the German coal trade is not very favourable, prices showing a downward tendency as regards almost every description. The deliveries of German coal upon foreign markets are falling off. Thus, Silesia is exporting less to Austria, while the Westphalian districts have forwarded less coal to Belgium and Holland. It is especially as regards the last-named country that the decline in the exports of German coal is most noticeable; this is attributed to the lowness of water in the Rhine, which has impeded deliveries by boat. The French enquiry for German coal has been rather considerable. Industrial coal has been less sought after in Germany in consequence of depression which is beginning to appear in the German iron-trade. Upon the whole, the situation must be pronounced less favourable, and to secure important contracts sensible concessions would certainly be made in prices.

The German iron trade has shown some little depression. New business has been scarce, and it has been difficult to carry through transactions, consumers having supplied their requirements for the present. Luxembourg pig has been supported with less firmness. Some special qualities have continued in demand, as, for instance, iron for construction purposes; but, speaking generally, the enquiry for metallurgical products has been languid. M. Paul Trasenster, in an interesting article on the course of metallurgical industry in 1881, estimates the world's production of pig last year at 19,700,000 tons. In this total Great Britain figured for 8,500,000 tons; the United States for 4,205,000 tons; Germany for 2,900,000 tons; France for 1,894,000 tons; Belgium for 613,000 tons; and other countries for 1,500,000 tons. M. Trasenster estimates the world's production of iron last year at 7,698,000 tons. In this total Great Britain figured for 2,000,000 tons; the United States for 2,115,000 tons; Germany for 1,358,000 tons; France for 985,000 tons; Belgium for 488,000 tons; and other countries for 742,000 tons. The production of steel in ingots last year is estimated by M. Trasenster at 5,220,000 tons. To this total Great Britain contributed 1,700,000 tons; the United States, 1,570,000; Germany, 950,000 tons; France, 950,000 tons; Belgium, 138,000 tons; and other countries, 400,000 tons.

The tone of the Belgian iron trade appears to have slightly improved, if anything. The demand has certainly not become more considerable, but still the current of orders has not fallen off, and some rather considerable contracts are stated to be in course of negotiation. Consumers continue to maintain an attitude of reserve, at the same time they have made proposals for new business, although it is difficult to come to an understanding in the important matter of prices. Some rather important proposals are stated to have been received in Belgium from China, and contracts have been nearly concluded, although a complete agreement has not yet been arrived at upon certain points. Stocks of iron are stated to have been run down very low in the Celestial Empire. Tenders for additional coal trucks for the Belgian State railways have been officially invited. It appears that it is proposed to place 2000 additional coal trucks upon the State lines; these trucks are to be constructed so as to carry 10 tons each. Quotations for pig have been pretty well maintained in Belgium. Business has been done in English casting pig at 2½ 10s. 10d. per ton delivered at Antwerp. Girders have made 5½ 16s. per ton in Belgium; plates have been in no great demand at 7½ 8s. per ton.

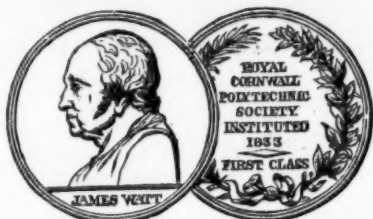
**WINDING GEAR FOR MINES.**—Some improvements, intended to prevent the great wear in the ropes by one coil chafing against the other, and obviating the necessity for coiling the ropes round the drums usually employed, have been patented by Mr. J. CRAYES, of Wakefield. He employs a single winding rope, an upper set of grooved head gear pulleys, and a lower set of grooved winding pulleys, each consisting of two pulleys and an intermediate grooved pulley between the two sets. The rope is attached at one end to one of the cages, passes over one of the head gear pulleys, under one of the winding pulleys (to which the motive power is applied), and back over the intermediate pulley, and then under the other winding pulley, and thence over the other head gear to the other cage, to which the end of the rope is attached. By this arrangement not only is greater durability of the rope ensured, but all tendency to slipping off the rope is entirely obviated, as in proportion as the weight of the load is increased the adhesion of the rope is augmented. The bearings of the intermediate pulley may be carried in a movable frame, either inclined or otherwise, so as to admit of the pulley being adjusted as required in order to maintain the rope taut.



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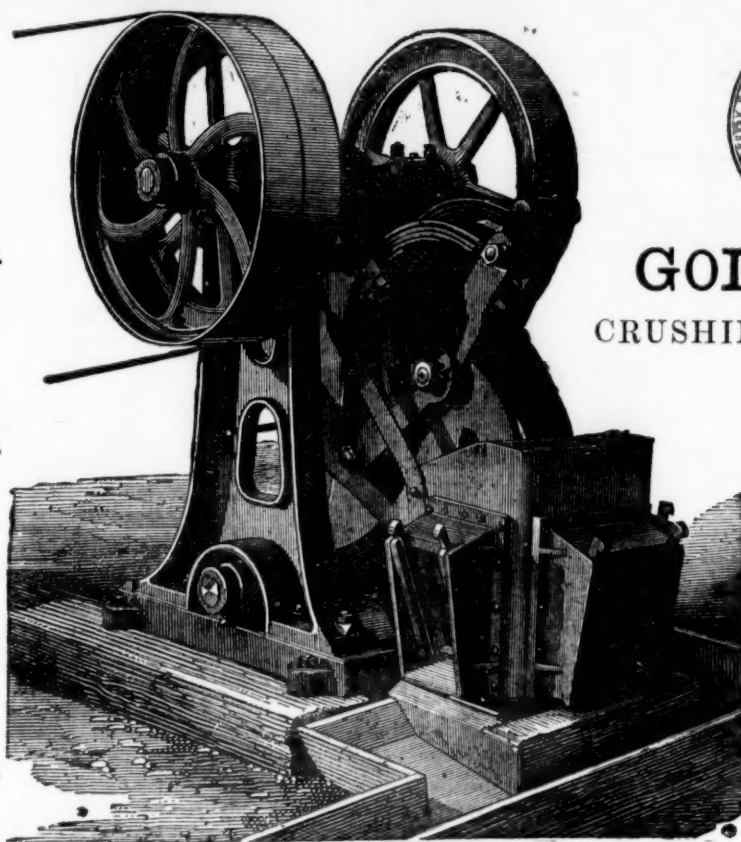
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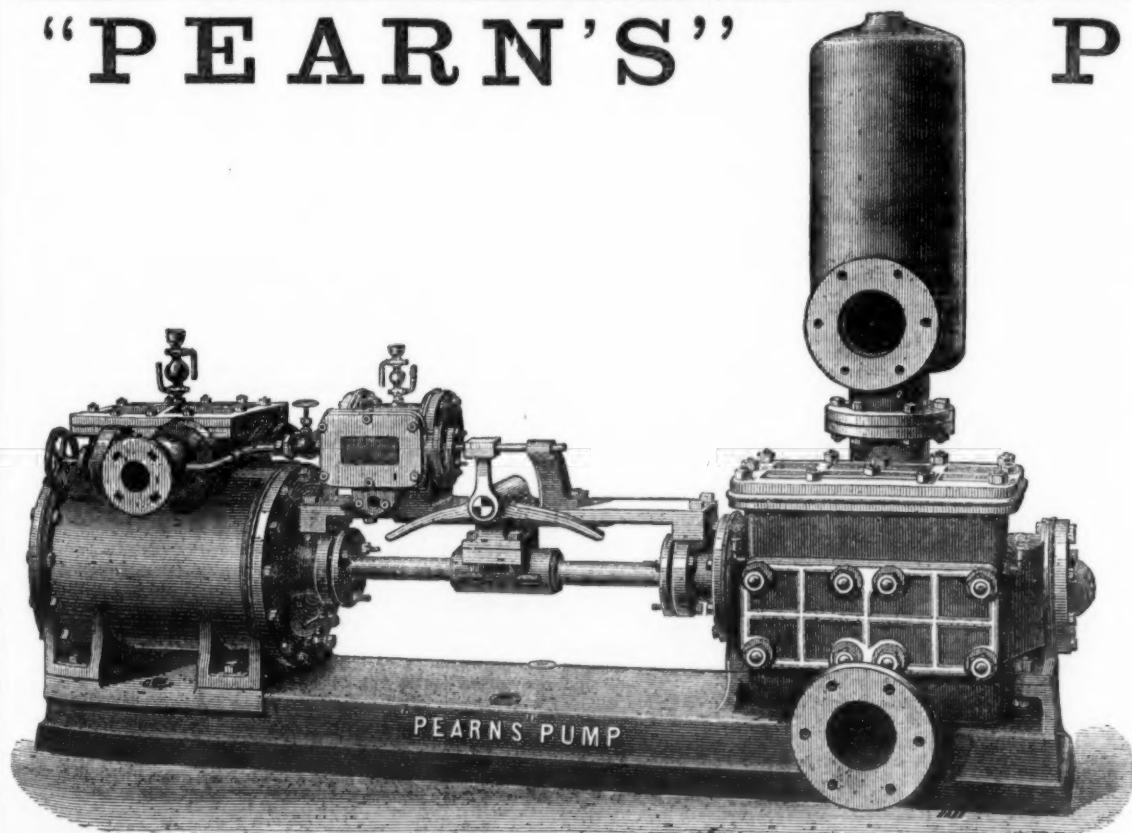
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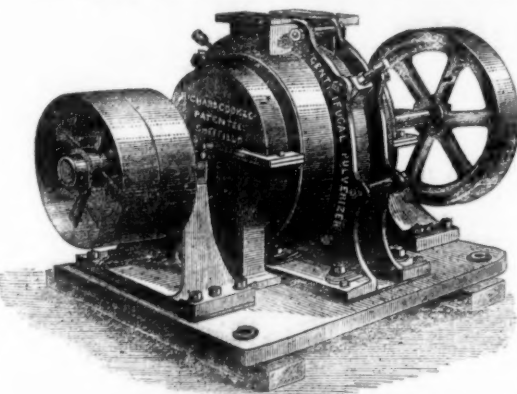
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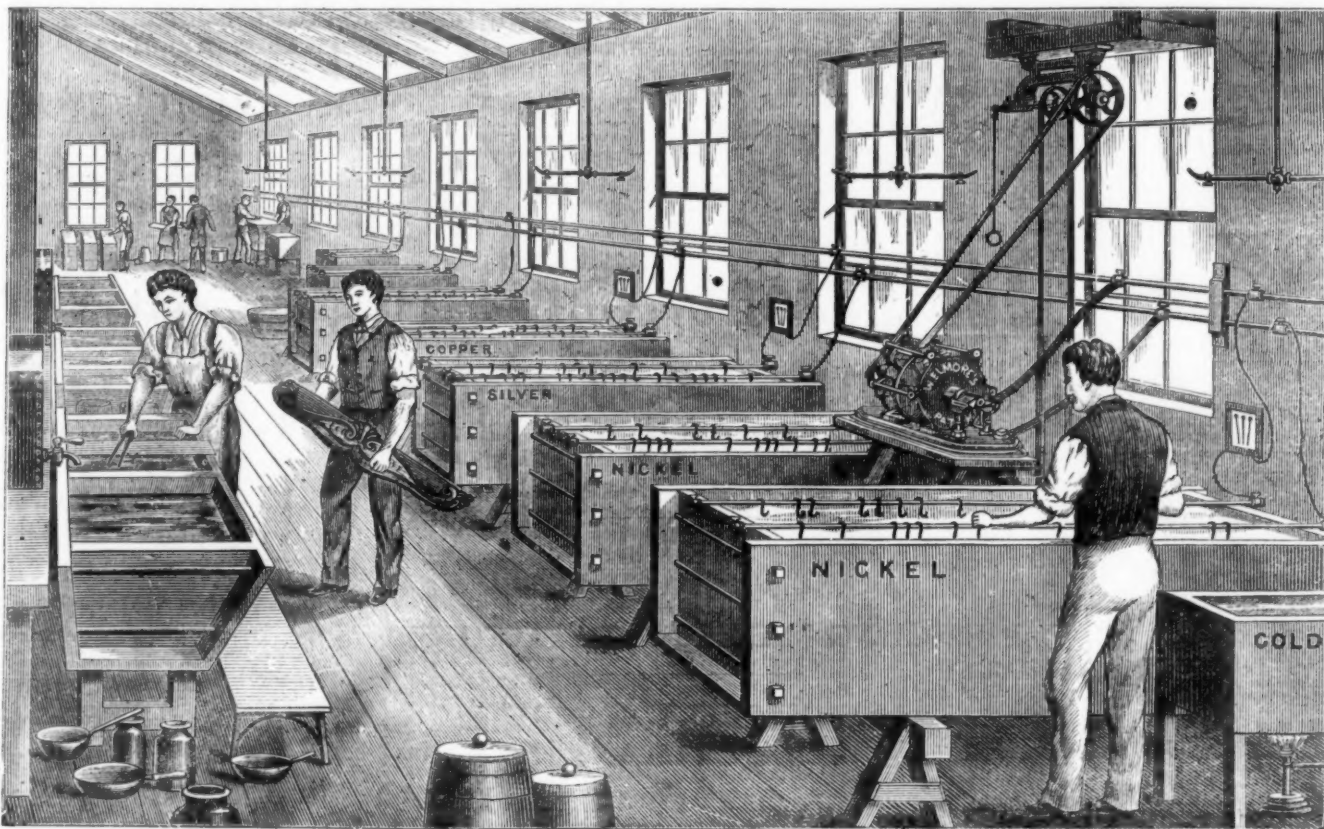
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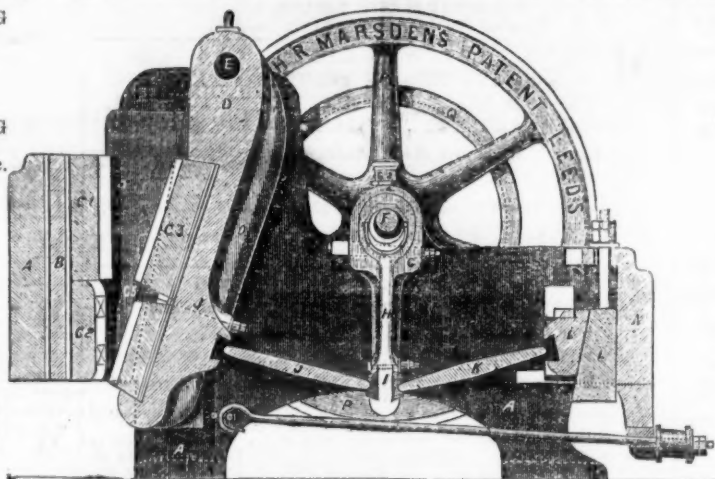
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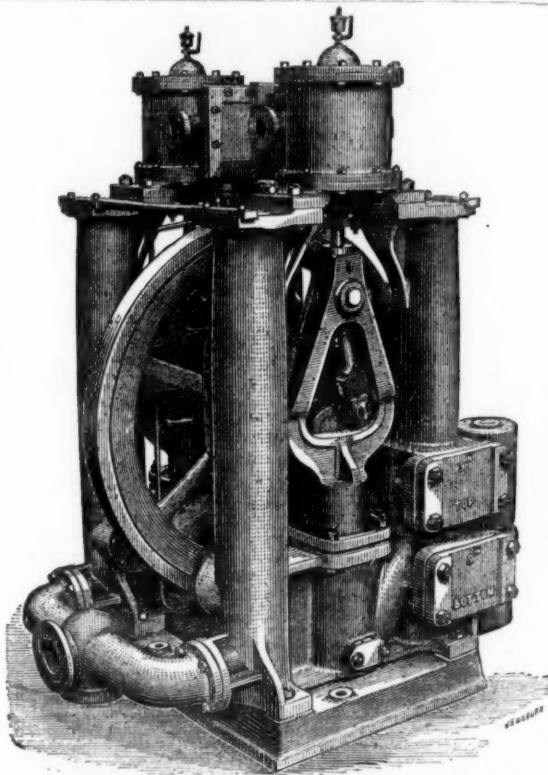
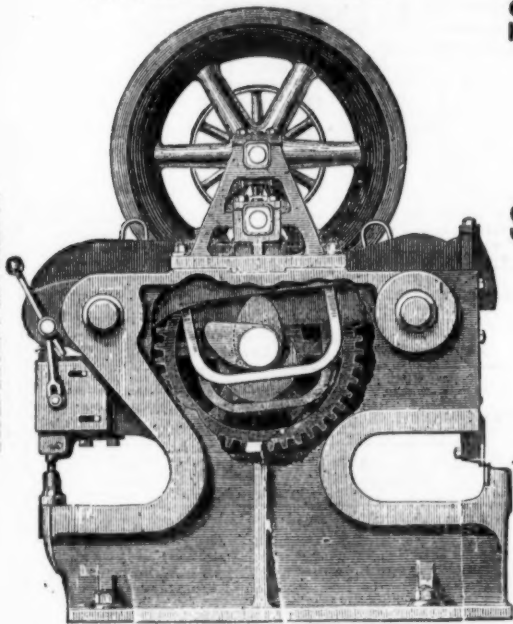
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